

NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

Volume 10, Number 16

An International Data Group Publication

April 19, 1993

NY Tel offers up flexibility, reliability

By Bob Wallace
Senior Editor

NEW YORK — New York Telephone Co. last week announced a family of fiber-based private-line services ranging in speed from 64K to 100M bit/sec that can be installed and reconfigured in as little as one hour.

The services are intended to safeguard New York firms — which handle an estimated \$1 trillion worth of financial transactions daily — from the cable cuts, power outages and storms that have crippled the nation's financial capital.

"Users here demanded flexible private-line services with features that would keep them in operation should any more disasters hit New York," said Carl Douglas, Enterprise Services product manager for New York Telephone.

The new Enterprise Services will be provided over existing fiber-optic cable and controlled from a new Enterprise Control Center (ECC) in Manhattan.

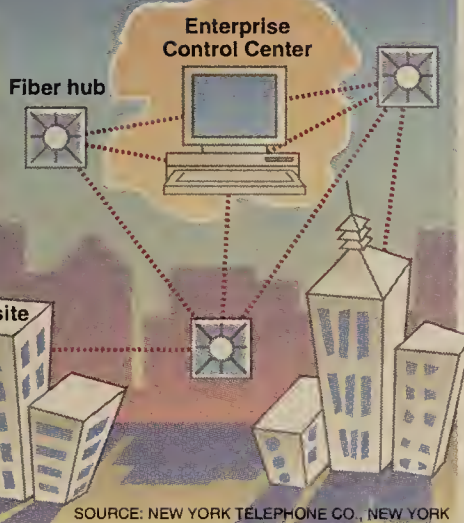
Network nodes consist of fiber multiplexers and high-speed digital private branch exchanges.

(continued on page 6)

New York gets fiber safety net

With Enterprise Services, technicians can:

- Provision service between any 2 points in about 1 hour.
- Reconfigure user networks in the same time frame.
- Reroute traffic around downed links faster than can be done today.
- Guarantee service restoration within 4 hours.



ATM may help the PBX realize a long-held dream

By Bob Wallace
Senior Editor

Visionaries see Asynchronous Transfer Mode (ATM) emerging in local-area networks as a way to support bandwidth-intensive technologies such as multimedia applications that integrate voice, data and video.

But oddly enough, the local network model the pundits see taking shape looks much like the one envisioned by industry analysts in the early 1980s: voice/data networks anchored by digital private branch exchanges.

While the PBX never achieved favor as a data switch, precious little has been said about what role PBXs will play in the new ATM realm. After all, their role will have to change if ATM is adopted as the base technology for corporate and carrier networks alike, as many predict.

Will ATM push the PBX back into a position of power in data networking?

The top PBX vendors seem to think so. Although they have been reticent about it to date, (continued on page 60)

Clinton security plan hints of Big Brother

Clipper Chip would let government eavesdrop on encrypted voice and data communications.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — President Clinton last week announced a policy review of encryption while endorsing a new encryption technology called Clipper Chip that would give law enforcement agencies a key to unlock users' encrypted communications.

The Clipper Chip technology, a private-key encryption algorithm contained on a chipset, was developed by the National Security Agency (NSA) and uses a key escrow system.

For every Clipper Chip-based encryption product sold, vendors will have to provide an escrow key capable of decrypting information scrambled by the unit to a federal agency that will be named as early as this week by the attorney general.

The president last week instructed the National Institute of Standards and Technology (NIST) to create a federal standard based on Clipper Chip within six months, meaning the technol-

ogy will soon become a mandatory federal procurement requirement for nonclassified but sensitive applications.

Clipper Chip is targeted at (continued on page 62)



Charles Wang and Bill Gates plot NT management strategy. Page 2.

Time Warner says it wants its ATM-TV

By Wayne Eckerson
Senior Editor

STAMFORD, Conn. — The nation's second largest cable company last week took the plunge into high-speed digital networking when it announced plans to install an ATM central office switch in Florida to support a host of interactive television services.

Time Warner Cable said the Asynchronous Transfer Mode switch from AT&T Network Systems will route voice, data and video traffic across an all-digital, broadband net dubbed the Full Service Network (FSN).

Time Warner Cable plans by next year to provide 4,000 residential customers in suburban Orlando, Fla., with on-demand access to vast libraries of movies, sports and cultural events. FSN will also provide subscribers alternative access to long-distance telephone networks and a variety of interactive video services, such as two-way video games, home shopping and distance learning programs.

"By adding fiber-optic and (continued on page 61)

NETLINE



FALLING FRAME RELAY equipment prices may drive down service costs. Page 2.

NET RELIABILITY COUNCIL to disband, despite user concerns. Page 4.

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FCC HOLDS OFF on controversial hearing aid rules. Page 4.

AT&T SEEKS ACCESS to U.K. market and asks FCC to block U.S. moves by BT. Page 6.

BUYER'S GUIDE dissects high-speed modem market. Page 40.



LAN industry wrestles with the plight of mobile users

Plotting escape from 'mobile networking hell.'

By Fredric Paul
Senior Editor

In the office, local-area networks give you fast access to files, applications, printers and other resources beyond the desktop and let you communicate with colleagues across the enterprise.

So when you hit the road with your notebook computer, disconnecting from the LAN can feel like losing your best friend. Suddenly, you're on your own, cut off from all the conveniences you have taken for granted.

As booming sales of notebook computers demonstrate, mobile computing is becoming a way of life for millions of telecommuters and business travelers. Vendors offer a slew of products that support remote LAN access with varying degrees of sophistication, but dialing in is only the beginning.

Today's remote users are stuck in "mobile communications hell," says Kenneth Dulaney, program director of operations automation strategies at Gartner Group, Inc.'s Bay Area (continued on page 59)



IBM powwow focuses on APPN product directions

Big Blue to deliver CMIP management tools for NetView and OS/2, address performance woes.

By Michael Cooney
Senior Editor

RALEIGH, N.C. — With a heavy emphasis on network management, high-speed routing and the integration of legacy systems, IBM last week detailed some important APPN product directions for the remainder of the year.

The products discussed here at IBM's Advanced Peer-to-Peer Networking Implementors Workshop (AIW) will help bring APPN products to market more quickly and eliminate many of the technology's nagging problems.

IBM demonstrated prototype Common Management Informa-

tion Protocol (CMIP)-based APPN network management applications for OS/2 and its host-based NetView network management platform.

IBM gave no time frame for the availability of the applications, but analysts said not to expect them much before the end of next year.

For NetView, IBM demonstrated a CMIP application that can automatically gather and graphically display data on all Network Nodes (NN) and End Nodes in an APPN net.

The application runs on top of
(continued on page 60)

CA to port Unicenter to Microsoft's Windows NT

Will provide NT mainframe-level mgmt. features.

By Wayne Eckerson
Senior Editor

WASHINGTON, D.C. — The world's two biggest independent software vendors, Microsoft Corp. and Computer Associates International, Inc. (CA), last week joined forces to announce mainframe-level systems management capabilities for Microsoft's Windows NT.

At a press briefing at the Federal Office Systems Exposition '93 trade show here, Microsoft Chairman Bill Gates and CA Chairman Charles Wang shared the stage in announcing that CA will port its CA-Unicenter sys-

tems management software to the emerging 32-bit operating system.

CA-Unicenter is a set of integrated systems management tools for handling such chores as work load management, performance management and problem tracking. While these tools have been available on mainframes for years, CA is one of the first vendors to offer a rich set of integrated systems management tools for Unix and local-area network platforms.

CA will soon ship CA-Unicenter on Hewlett-Packard Co.'s
(continued on page 61)

StrataCom offers cards to lower price of frame relay

By Jim Duffy
Senior Editor

SAN JOSE, Calif. — StrataCom, Inc. last week unveiled frame relay interface cards for its IPX and Broadband-PX (BPX) switches that could allow carriers and users to lower the price of delivering public and private frame relay services.

The new FRI T-1 and FRI E-1 cards let as many as 31 devices share a single high-speed frame relay link, up from the previous limit of one. This will help carriers and users extend the reach of their frame relay nets by using smaller StrataCom switches to

support numerous users that require only small amounts of bandwidth.

It should also lower costs for carriers such as AT&T, CompuServe, Inc. and WilTel, which use StrataCom switches to provide frame relay services, and those savings may, in turn, be passed on to customers.

The FRI T-1 and FRI E-1 are single-port cards that connect an IPX or BPX switch to a channel bank or digital cross-connect switch at speeds ranging from 56K to 2M bit/sec. They allow users to segment a T-1 or E-1 trunk
(continued on page 62)

Briefs

Let's make a deal. The seven regional Bell holding companies last week lobbied the Clinton administration to allow them into long-distance services, cable television and equipment manufacturing in exchange for a \$100 billion investment in the local network. Top executives from the RBHCs told Vice President Al Gore that their companies would build the administration's proposed broadband information highway without federal subsidy if the companies are allowed into now-restricted lines of business.

Marshall quits FCC. Federal Communications Commissioner Sherrie Marshall last week resigned from her post on the commission to start her own firm, the Marshall Co. in Los Angeles, which will offer strategic planning to entertainment and communications firms.

SIG formed for IBM's DLSw. Twelve vendors, including Cisco Systems, Inc., IBM and Proteon, Inc., last week formed a special interest group (SIG) within IBM's APPN Implementers' Workshop to aid in developing IBM's Data Link Switching (DLSw) routing technology. The SIG will pass its recommendations to the Internet Engineering Task Force, which last month made DLSw an informational request for comment, giving any vendor free access to the specification.

NeXT lines up OS support. In an attempt to become a serious contender in the battle of the network-capable, 32-bit, object-oriented operating systems, NeXT Computer, Inc. has signed Data General Corp., Dell Computer Corp., Epson America, Inc., NEC Technologies, Inc. and Siemens Nixdorf Informationsysteme AG to sell the NeXT-Step OS on new high-end personal computers. In addition, Hewlett-Packard Co. has certified the operating system for use on its PCs, and there are reports that NeXT is close to an agreement with IBM. NeXT said it plans to begin selling NeXTStep in late May for \$795.

BellSouth buys Fujitsu switches. BellSouth Telecommunications, Inc. last week said it will purchase eight Asynchronous Transfer Mode (ATM) switches from Fujitsu Network Switching of America. The carrier will announce an ATM service in the first quarter of next year that will be sold on an individual-case basis, rather than under a general tariff. The company plans to install 30 to 35 ATM switches in its region during the next three years.

Sprint extends toll fraud protection. Sprint Corp. last week announced that it has extended the reach of its SprintGuard Plus toll fraud protection service. Sprint will now protect against losses of as little as \$10,000 per incident, down from \$25,000. The per-incident cap remains the same at \$1 million. The service will be offered under one-year contracts, in addition to the existing three-year deals for voice services, and will cover Sprint's 800 services. It previously covered only outbound international services.

Start-up to focus on Unix mgmt. OpenVision, a new software company dedicated to management of distributed Unix systems, will introduce itself at a press conference next week in New York. OpenVision will announce some 14 products and technology exchange agreements with Hewlett-Packard Co., Open Software Foundation, Inc. and Unix System Laboratories, Inc. The company will also disclose some high-profile customer accounts, including pharmaceutical giant Glaxo Holdings plc, Millipore Corp. and investment firm Salomon Brothers.

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Article and chart reprints (minimum 500 copies) can be ordered from Donna Kirkey, Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172; (508) 875-6400.

Back issues (\$5 per issue) can be ordered from Bobbie Cruise by calling (800) 622-1108.

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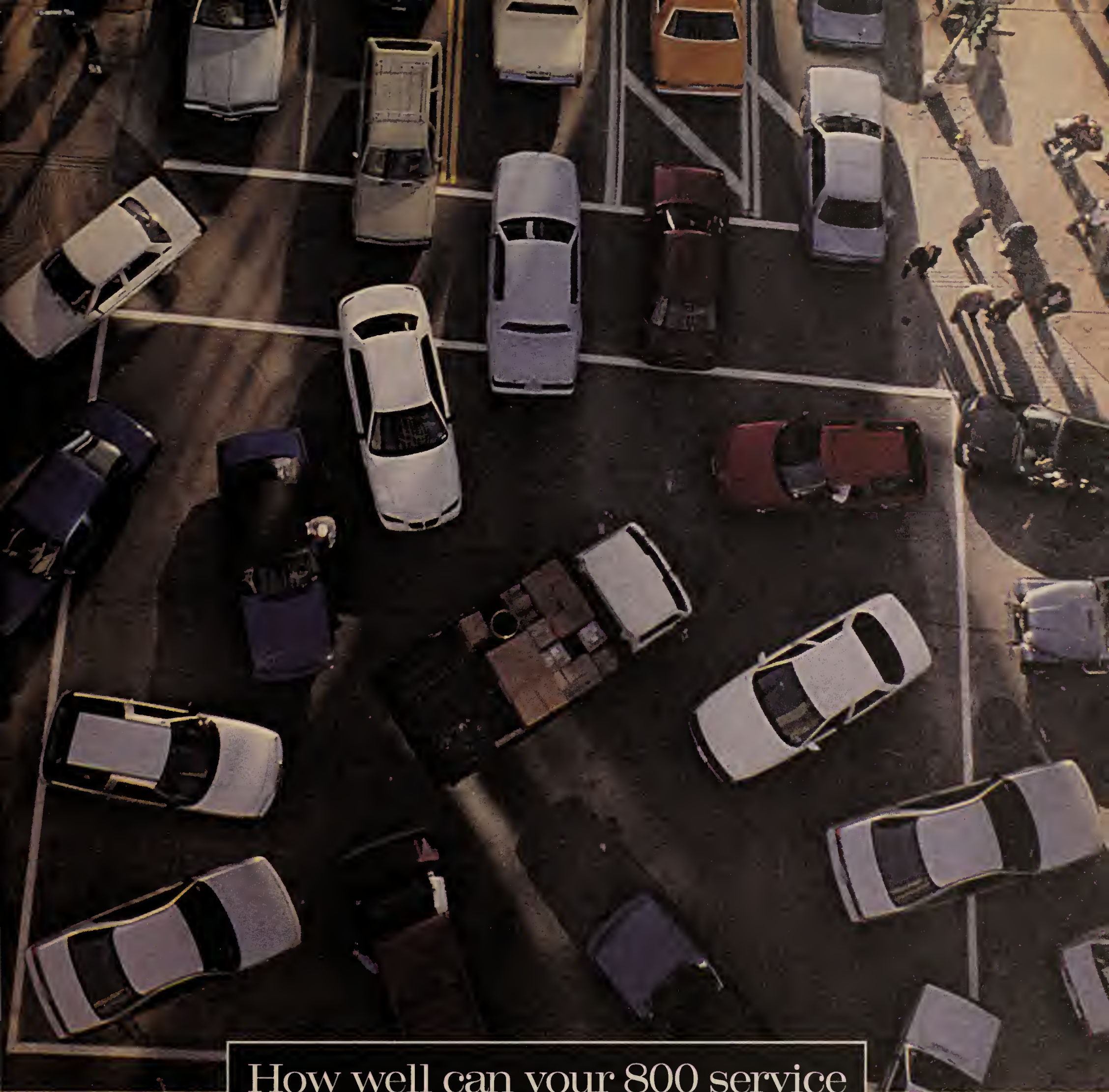
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How well can your 800 service control heavy traffic?

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Fortunately, Sprint has devised a number of alternate routes to make sure you get every call in the midst of busy 800 traffic. For instance, our 800 Call DirectorSM features a unique graphic interface that lets you redirect your 800 traffic with point-and-click convenience. This makes it easy to reroute calls, even as your call center is reacting to its own version of rush hour.

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Sprint.

Network Reliability Council to disband, hand off work

But ICA, others call council's decision premature.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The Network Reliability Council (NRC), the industry group formed in 1991 after several major outages struck public carrier networks, last week voted to disband by June.

The NRC, composed of two dozen top executives from the local and long-distance telephone companies, as well as a few state regulatory and consumer groups, said its mission of recommending ways to avoid network outages was complete.

But some observers, including the International Communications Association (ICA), called the decision to disband premature, noting that the final reports of the NRC's seven focus groups will not even be published until June.

The NRC voted to transfer its primary functions of outage analysis to a new group, the Reliability Steering Team, to be formed within the trade group Exchange Carrier Standards Association (ECSA).

"We're talking about empowering the ECSA; we're taking an existing responsible body and handing off the thrust," said John Clendenin, chairman and chief

executive officer of BellSouth Corp. and a member of the council.

Lone dissenter

Only one member of the council cast a dissenting vote regarding its disbandment.

"We don't want to see these recommendations end up on a bookshelf," said Ronald Binz, director of the office of consumer counsel at the State of Colorado who represented the National Association of State Utilities Commission Advocates. "We want to see them implemented."

Others outside of the NRC echoed Binz's sentiments.

"The people running around saying the council should be dissolved said network reliability wasn't an issue to begin with," said Brian Moir, counsel for the ICA. "The strongest proponents of disbanding never wanted this issue to be subject to a federal advisory group."

The NRC has done good work that should not be turned over to a closed group such as ECSA, Moir said.

But others disagreed. Steve Hewitt, chairman of the Tennessee Public Service Commission who represented the National Association of Regulatory Utility

Commissioners, said he believed that the group had fulfilled its charge and could now hand off its functions to an established group.

The NRC was formed in 1991 following a rash of major outages that struck carriers including AT&T, Bell Atlantic Corp. and Pacific Telesis Group. Some said it was established largely to head off Congressional actions to regulate the industry.

FCC Common Carrier Bureau Chief Cheryl Tritt noted that due to the NRC's existence, "The FCC has kept out of the congressional woodshed for the last year."

Nonetheless, the NRC did establish reporting guidelines for outages. It drew from the considerable technical resources of its carrier members to sift through data and make recommendations on reducing outages, whether caused by switch failures, software bugs or cable cuts.

The NRC proved to be a useful forum for the top management of the contentious network industry to sit down and publicly discuss how emergency situations might be handled.

Last week, the NRC declared cable cuts to be public enemy No. 1 in outages.

The NRC may ask for FCC support of national "one-call" legislation, making it mandatory to check the location of lines before digging.

The group must get FCC permission to disband so the ECSA could take over the analytical work. □

FCC stays hearing aid compatibility

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The Federal Communications Commission last week delayed implementation of rules that would have required users to modify telephone systems supporting more than 20 employees to be hearing aid-compatible by May 1.

The FCC was moved by urgent pleas from groups such as the Tele-Communications Association, Inc. and the International Communications Association (ICA), which said the rules would constitute an economic hardship because they would have cost users thousands of dollars to retrofit telephone systems. The rules are temporarily suspended, but the FCC still plans to revive the issue at a later date.

The FCC rule was carrying out the legislative mandate of the

Hearing Aid Compatibility Act of 1988. But some claim that the FCC went far beyond the scope of the act.

"The Hill required hearing aid-compatible phones in public places," said Brian Moir, counsel for the ICA. "This would have affected every phone at work."

According to Moir, the rules would have required hearing aid-compatible devices to be installed in every telephone handset.

The FCC estimated that it would cost between \$1.50 and \$45 to retrofit a single phone, but the agency later admitted that the \$1.50 figure was underestimated.

The North American Telecommunications Association (NATA) said the FCC order called for penalties of as much as \$10,000 per day, or a maximum fine of \$75,000, for failure to obey the rule. NATA was among those rigorously lobbying against the May 1 deadline.

"Though the requirement has been postponed, the FCC has not eliminated this ruling," said NATA President Ed Spievack. "Those who have already retrofitted [phones] may be just one

step ahead of the game."

In its decision to stay the new rules — which, in 1994, would have extended to businesses with less than 20 employees — the FCC said it encountered considerable opposition.

"As the implementation date approached, we began to receive a large number of telephone calls expressing concern or seeking clarification of the new regulations," the FCC order stated. The agency noted that nearly 50 organizations "purporting to represent over a million businesses, government agencies, universities and nonprofit institutions" objected to the rules.

The FCC suspended all of its hearing aid-compatible rules, although it noted that telephones in confined settings, such as rooms in hospitals, health care facilities and prisons, should still accommodate the hearing impaired.

Additionally, hotels and motels must ensure that at least 10% of their rooms can accommodate a hearing-impaired person.

"[The suspension] will give us an opportunity to fine-tune [the requirement]," Moir said. □

DOD claims net overhaul going well

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The massive Department of Defense reorganization of computing resources begun last October has affected thousands of service personnel, leaving them in the dark about their authority to purchase network equipment.

The Defense Department Directive 918 put information systems procurement authority and the data processing centers of the Navy, Army and Air Force units under control of the Defense Information Systems Agency (DISA), while forcing thousands of technical personnel to join DISA.

The transition — and many unanswered questions about DISA's role — have created con-

fusion in the Defense Department's work force, but last week a top official from the Office of the Secretary of Defense promised that the department's game plan, scheduled for release this July, will offer needed detail on its long-term strategy.

Speaking at the FOSE show here, Ron Oxley, director of information technology resources at the Office of the Secretary of Defense, fended off questions and complaints from military personnel affected by Directive 918, the initiative regarded by the Defense Department as a corporate restructuring.

Directive 918 includes consolidating 1,700 data processing centers into 20 megacenters, transferring of most military technical personnel to DISA, and creating a more coherent network infrastructure out of the more than 100 separate wide-area networks in place today.

Oxley pointed out that one purpose of 918 is to centralize operations control in order to bring interoperability and security (continued on page 61)

UB eases E-net mgmt. with alarm, statistics upgrades

By Skip MacAskill
Senior Writer

SANTA CLARA, Calif. — To give managers more control over their 10Base-T nets, Ungermann-Bass, Inc. last week announced management enhancements for its intelligent hub line that will provide more complete statistics, alarm information and security.

The new features, which will be available on all of the 10Base-T Ethernet modules for the company's Access/One hub, represent additions to UB's Tier 2 and 3 management tool sets.

UB has structured its management offerings so users begin with a basic package, called Tier 1, and as their net requirements grow, they can add packages from Tier 2 and 3.

Being rolled out in Tier 2 is a thresholds and gauges application that is based on the IEEE 802.1F standard. It allows network managers to monitor a wide range of performance, fault and address tracking statistics down to the port level, as well as control how the network will react.

"There are 39 gauges, and each has both a warning threshold and an alarm parameter that the net manager sets," said Brian Schanning, Access/One development manager at UB. "A gauge is software that rapidly samples statistics like collisions and frame check sequence errors and averages them over a period of time."

The net manager can configure the application to merely report an alarm or automatically shut down a port, thereby isolating problems before they can impact the rest of the network.

The application is bundled with the 24-port Ethernet modules UB announced for the Access/One two weeks ago and available as a daughterboard upgrade to the existing 12-port versions.

UB's new Tier 3 management offering is the Network Message Security Method and Apparatus, which provides two levels of net security — eavesdrop protection and intrusion protection.

In eavesdrop protection mode, only data is sent to authorized destination addresses. The intrusion feature lets net managers identify unauthorized devices on the net and shut them down automatically.

"If you have someone who is plugged into the network with an unauthorized address, we can prevent them from sending data onto the net and getting data off the net," said Surya Panditi, general manager (continued on page 6)



Panditi



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Business Objects releases upgraded data access tool

By Bob Brown
Senior Editor

MENLO PARK, Calif. — Business Objects, Inc. this week will announce a new version of its client/server data access tool with wider database support.

Version 2.2 of BusinessObjects features interfaces to Digital Equipment Corp.'s Rdb, IBM's DB2, Informix Software, Inc.'s Informix-OnLine, Ingres' Ingres Intelligent Database and Sybase, Inc.'s SQL Server. The earlier version worked only with Oracle Corp. databases.

Business Objects is a \$6 million firm based in France that is making a push this year to increase its presence in the U.S.

The BusinessObjects software is designed to present information from databases to end users in their own vocabulary in what Business Objects officials refer to as a "universe," rather than in complex database tables. Universes are sets of easy-to-manipulate object-like data for specific classes of end users.

A client component of the software handles the graphical presentation of data, as well as

report and graph generators. Object-like data definitions reside in a data store on a database server. The server component contains rules by which users access data.

BusinessObjects features a module that enables database administrators to define end-user

BusinessObjects is evolving to support a variety of databases and middleware products.

▲▲▲

universes and security rules, as well as set access parameters such as query length.

"A lot of tools just let end users have at the data," said Liz Barnett, a vice president at New Science Associates, a Westport, Conn.-based consultancy. "Business Objects recognizes MIS has an important role to play in ensuring data integrity but gives end

users a good degree of flexibility."

BusinessObjects is evolving to support a variety of databases and middleware products so it fits into multivendor environments, according to Bernard Liautaud, president of Business Objects. BusinessObjects features a library of SQL calls supported by database products and network calls supported by various middleware offerings.

BusinessObjects communicates with most databases through vendor-specific extensions to application program interfaces. The software supports DB2 via Micro Decisionware's Database Gateway for DB2 and is being extended to communicate with DB2 via other data access tools.

BusinessObjects currently supports Microsoft Corp. Windows and DOS clients and will support Apple Computer, Inc. Macintoshes, Open Software Foundation, Inc. Motif and Unix in a character mode by July. It will also support Microsoft's Open Data Base Connectivity access specification by year end.

The software is priced at \$595 per user module and \$3,495 for the manager module. Typically, users buy one management module per eight end-user modules. ■

AT&T seeks access to U.K. market

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — AT&T last week applied for a license with regulators in the U.K. that would let it extend international services across U.K. borders to end users, sell services in the U.K. and resell services over private lines between the U.K. and Australia, Canada and Sweden.

In a separate but related effort, AT&T asked the Federal Communications Commission to freeze an application by BT to offer similar services in the U.S. until the U.K. market is open to competition from U.S.-based carriers.

Although the U.K. Department of Trade & Industry (DTI) opened up the domestic U.K. market many years ago, letting Mercury Communications, Ltd. vie for a piece of the pie, foreign carriers today have to hand off calls on their networks to BT or Mercury for completion.

The skirmish between AT&T and BT is said to be the first major confrontation between U.S. carriers and foreign carriers, each looking for access to the other's market.

BT started the feud in March when it asked the FCC for approval to operate the U.S. end of its Cyclone project, a global switched net effort in which the carrier plans to invest \$1 billion. The agency has not yet ruled on the issue.

AT&T has upped the ante by asking the DTI for permission to offer network services to firms in the U.K., as well as asking the FCC

to withhold the license that would enable BT to compete with AT&T and other carriers in the U.S.

"We are eager to compete in the U.K. marketplace," said John Berndt, president of AT&T's Business Services unit. "When BT and American carriers can compete on an equal footing, customers in both our countries will reap the benefits."

AT&T expects it to take six months to a year for DTI to rule on its application, an AT&T spokeswoman said. But the FCC could approve BT's application in as little as several weeks.

Landmark development

Analysts said AT&T's entry into the U.K. market is more important to U.S. users than the possibility of BT entering the already crowded U.S. market.

"[AT&T's entry] into the U.K. would be a landmark development," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy. "AT&T would be able to offer services like [Software-Defined Network], 800 and WATS to users in the U.K., giving BT some serious competition."

Berndt said AT&T would offer "a wide variety of competitively priced, seamless services between the U.S. and the U.K. for business customers with locations in both places," but would not say which services they would be.

The carrier would offer services including SDN and digital private lines for U.K. firms that do not have locations outside of the U.K. "We'd also provide these services between the U.K. and Australia, Canada and Sweden."

This last effort would be possible because the U.K. and the three other carriers permit international resale of services between their countries. ■

NY Tel offers up flexibility

continued from page 1

tal access and cross-connect systems interconnected using Fiber Distributed Data Interface rings. Firms access the nodes using on-premises, carrier-owned and operated intelligent channel banks and fiber multiplexers.

The Enterprise Services, which cost 15% to 20% less than current private-line offerings, make it possible for the carrier to provision service faster by simply using the ECC to interact with the customer premises equipment.

"The big hook here is the service provisioning time, which is much faster than you can get with today's private-line services," said Ryan James, director of telecommunications research and consulting for The Yankee Group, a Boston consulting and research firm. James is a former network manager with United Technologies, Inc.

But on the downside, the company's insistence on handling all aspects of the service may not appeal to the sophisticated users for which the offerings are designed. "New York Telephone is reverting to the let-us-control-everything mentality with the services," James said.

The services include five offerings: Enterprise DSO supports

speeds up to 64K bit/sec; Enterprise Fractional DS1 is offered at 128K, 256K, 384K, 512K and 768K bit/sec; Enterprise DS1 is available at 1.544M bit/sec; Enterprise DS3 is offered at 45M bit/sec; and Enterprise Fiber Distributed Data Interface works at 100M bit/sec.

Standard features include free service installation and feature activation, the capability to install or reconfigure lines within 24 hours, a service restoration guarantee of four hours, around-the-clock network monitoring and free grooming as well as the combination of low-speed channels such as 64K bit/sec connections into higher speed links.

An optional Flexible Data Speeds feature enables link speeds to be changed within an hour after the customer's request, turning them up from 2,400 bit/sec to 4.8K, 9.6K, 19.2K, 56K or 64K bit/sec.

The Demand Reconfiguration option enables New York Telephone to reroute traffic to alternate locations within one hour of a customer's request. Scheduled Reconfiguration enables users to plan a regular schedule for reconfiguration of 64K, 1.544M and 45M bit/sec links.

With the services' Emergency Planning-Alternate Path feature, a customer-specific routing plan can be activated to replace a

failed link. The plan includes primary and alternate paths, and assigns priorities to circuits to ensure that the most important links are rerouted first.

The final service, Enterprise FDDI, is targeted primarily at users with distributed client/server applications. The service provides a dedicated 100M bit/sec link between sites and works with customer premises equipment that has a standard, single-mode FDDI interface.

Ron West, senior manager of telecommunications and office automation with Shearman & Sterling in New York, pointed out that the FDDI offering is the only local-area network interconnect service in the portfolio, something he would like to see more of. "The FDDI service is great, but I'd like to see New York Telephone roll out Enterprise Services that enable users to link [10M bit/sec] Ethernets and [16M bit/sec] token-ring LANs," he said. "These services would be of interest to quite a few users."

The Enterprise Services are available in midtown and lower Manhattan and will be available by year end in selected parts of the rest of the city, Long Island and Westchester County. The services will be offered in Albany, Binghamton, Buffalo, Poughkeepsie and Syracuse, N.Y., by the second quarter of 1994. ■

UB eases mgmt. with upgrades

continued from page 4

eral manager of the Access/One business unit at UB.

According to Panditi, this feature is particularly effective because UB has a distributed management architecture that spreads management processing power across the modules themselves rather than confining the functionality to one management module. This setup allows faulty ports and unauthorized addresses to be disabled more quickly.

"If you're waiting for the packet to go from the port all the way to a management module, it's possible to get many bad packets through before a security feature kicks in and shuts the port off," Panditi explained. "If someone is generating garbage, you

want to be able to take action as soon as you see the header. By putting the processing power on the card itself, you can do that."

The Tier 3 security features will be available on both the 12- and 24-port modules as a software upgrade.

To give users access to the new management features on the 10Base-T modules, the Simple Network Management Protocol agent in UB's Supervisor Management Module, which acts as an interface between the Access/One modules and UB's NetDirector network management system running on a management console, had to be enhanced.

This new Advanced Management Agent is available as a software upgrade and costs \$495 for the two-slot Access/One and \$1,695 for either the five- or 11-slot enclosures. ■

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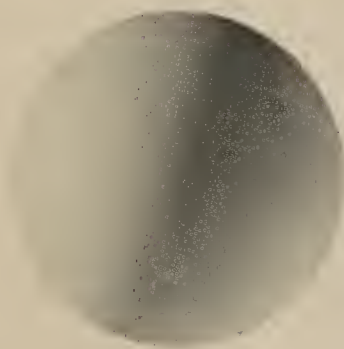
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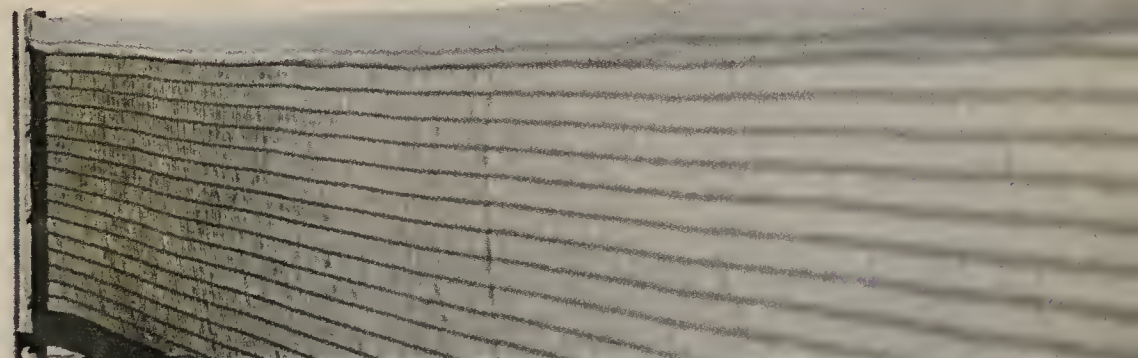
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Although, considering ROLM's reliability, that person is likely to remain a bit of a stranger. In fact, ROLM received the highest ratings for both hardware reliability and system performance in the most recent Customer Satisfaction Survey held by Dataquest®.

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SW56II	Accunet Sw. Digital	56 Kbps	4-wire Sw. Digital	Keypad, Autodialer
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA110	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD
TA120	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
FT100S	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Single Port
FT100	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Dual Port (Expandable)
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/V.32	DSU with V.32 Modem	56 Kbps	DDS/ Analog	Auto-dial Backup
T1-ESF-CSU	CSU	1.544 Mbps	T1	ESF & D4 Framing
Digital-DBU	Digital Dial Backup	56K-1.544Mb	DDS/ Frac. T1	Universal Digital Dial Backup

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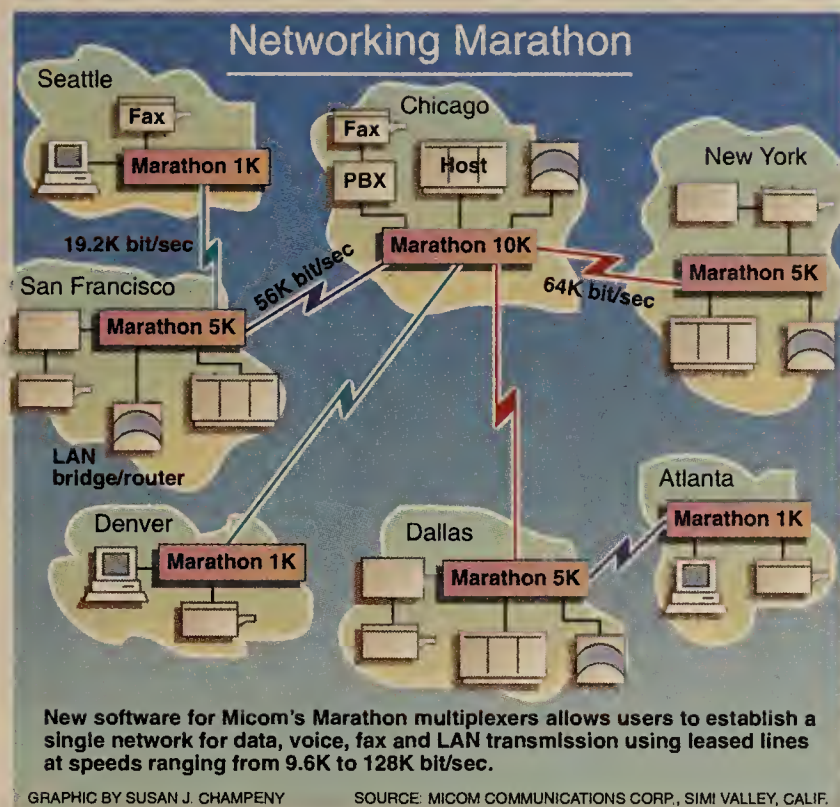
DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

“**M**ultivendor interoperability shouldn't be touted by a vendor as an additional function of any networking product; it should be an integral part of the product from the beginning.”

Raymond Mueller
President
Management Information
Support, Inc.
Lakewood, Colo.



Micom unwraps high-end mux with data, fax, voice

Also offers software to switch voice, fax traffic.

By Jim Duffy
Senior Editor

SIMI VALLEY, Calif. — Micom Communications Corp. last week expanded its Marathon line of data/voice multiplexers with the introduction of a higher end model.

The company also unveiled software that allows the Marathon systems to switch voice and facsimile traffic, as well as brought out a network management system to monitor and control nets based on the muxes.

Micom's Marathon line of multiplexers allows users to funnel data, voice, fax and local-area network traffic over leased lines at speeds from 9.6K to 128K bit/sec. The muxes chop data packets and voice streams into 25-bit cells to maximize efficiency and minimize transmission delay, said Ken Guy, Micom vice president of corporate strategy and business development.

Until now, the high end of the Marathon line was the Marathon 5K, which supports five wide-area links at up to 72K bit/sec, 41 asynchronous input channels at 38.4K bit/sec and six synchronous input channels at 56K bit/sec. It also supports eight 16K bit/sec voice and fax channels and an Ethernet connection.

The new Marathon 10K supports 12 wide-area network connections at up to 128K bit/sec, 12 synchronous input channels at up to 64K bit/sec, and the same

number and speed of asynchronous channels as the 5K. It also handles eight 16K bit/sec channels for voice and fax transmission, plus two Ethernet connections that each support as many as 64 users.

Using the new software, Marathon multiplexers can now be used to switch voice and fax signals over a private Marathon net-

Marathon muxes can now be used to switch voice and fax signals over a private net.

▲▲▲

work. Previously, the muxes supported point-to-point connections only. The software, Total Connectivity, allows users to place calls over leased-line nets anchored by Marathon muxes.

The new mux, which features a 16M bit/sec internal bus, can serve as a central switching node for a network of Marathon 5K and 1K devices, Guy said. As many as 250 sites can be networked into one Marathon 10K system, he added.

Transammonia, Inc. in New
(continued on page 26)

IBM polishes 3172 for high-speed nets

Plans to add ATM, SMDS, FDDI and several other high-speed connectivity capabilities to controller.

By Michael Cooney
Senior Editor

RALEIGH, N.C. — IBM is positioning its 3172 Interconnect Controller as a linchpin in future high-speed networks and, toward that end, will soon add a variety of new features to the device, including support for ATM and SMDS.

IBM told *Network World* it plans to add Asynchronous Transfer Mode, Switched Multi-megabit Data Service, Fiber Distributed Data Interface support as well as other enhancements to the 3172 in the next 12 to 24 months. These new high-speed connectivity capabilities will make it easier for users to integrate local- and wide-area network environments and build more powerful data networks.

The 3172 is a channel-attached gateway that allows LANs to access IBM mainframes.

IBM is currently testing a prototype 3172 host-to-host connection using an SMDS service pro-

vided by MCI Communications Corp. The SMDS service will not be available until June.

The prototype 3172 is running a new, enhanced version of the 3172's operating system, and an IBM High Speed Serial Interface (HSSI) board connected to a Digital Link Corp. DS3200 data service unit (DSU)/channel service unit. The DSU converts data coming through the 3172's HSSI port into SMDS format and sends it over the MCI service to another 3172 at speeds up to 44.736M bit/sec.

SMDS support will enable 3172 users to link mainframes at high speeds over unlimited distances without using expensive leased lines. IBM offers a high-speed channel link today with its Enterprise System Connectivity (ESCON) technology, which has a distance limitation of about 36 miles.

“We're focusing on host-to-host data transfers now, but we
(continued on page 26)

Mainframe giant Hitachi tests client/server waters

By Caryn Gillooly
Senior Editor

SANTA CLARA, Calif. — A pillar of the mainframe world has announced a new client/server strategy and the first products designed to bring the strategy to fruition.

Hitachi Data Systems Corp. (HDS) unveiled Osiris, a series of hardware and software products that will help Unix users employ HDS mainframes as high-end local-area network servers.

The primary software component of Osiris is HDS' new HI-OSF/1-M operating system, which is based on the Open Software Foundation, Inc.'s (OSF) OSF/1. The operating system will run on HDS mainframes and on the hardware component of Osiris, the Network Co-Processor.

The Network Co-Processor is a scalable processor architecture-based machine that connects the

LAN to a mainframe channel at 4.5M byte/sec. It can support as many as four direct Ethernet connections, providing connectivity for a total of 100 machines.

The Network Co-Processor supports the Transmission Control Protocol/Internet Protocol and the Network File System, letting it communicate with applications on the Unix-based workstations to which it is attached.

Similar to IBM's 3172 Interconnect Controller, which can also run TCP/IP software, the Network Co-Processor acts as an accelerated front-end processor.

“The Network Co-Processor can provide approximately four times the throughput at one-half the response time of the current mainframe network processing technology using equivalent processing power,” according to company statistics.

(continued on page 24)

Data Packets

Networkx, Inc. of El Paso, Texas, has announced that it will integrate Accugraph Corp.'s MountainView configuration management application with its Paradigm trouble-ticket application.

When the Paradigm application kicks off a trouble ticket, the trouble ticket will include MountainView's graphical representation of the user's net devices to more accurately show where a problem is located.

The new Paradigm trouble-ticket application with the integrated MountainView support is available now.

Pricing for the product was not announced.

NetLabs, Inc. last week said NCR Corp. will resell its OverLord network management technology as the NCR StarSentry network and systems management product.

NCR will develop management applications for Unix, DOS and OS/2 systems, frame relay networks and software distribution to run on top of the OverLord platform.

In addition, the company will offer an OverLord-based StarSentry product line later this year. ■

Announcing the first network printer



<i>Operating System</i>	<i>Topology</i>
Novell Netware	*Ethernet/802.3 Token Ring (4/16 Mbps)
Microsoft® LAN Manager	*802.3 Token Ring (4/16 Mbps)
Windows for Workgroups	*802.3 Token Ring (4/16 Mbps)
Windows NT	*802.3 Token Ring (4/16 Mbps)
IBM LAN Server	*802.3 Token Ring (4/16 Mbps)
AppleTalk	*LocalTalk *EtherTalk
HP-UX**	*Ethernet
SunOS**	*Ethernet
Solaris**	*Ethernet
SCO UNIX®	*Ethernet

*Standard in the HP LaserJet 4Si MX printer. **For operating HP-UX, SunOS or Solaris, a one-time purchase of \$199 in configuration software is required. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. Microsoft is a U.S. registered trademark of Microsoft Corporation. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. †In Canada call 1-800-387-3867, Ext. 7299. © 1993 Hewlett-Packard PE12353

Multiple environments are no longer worlds apart. Even if you have Novell Netware on one network, HP-UX on another and EtherTalk on a third, the new HP LaserJet 4Si MX printer easily connects across platforms. Automatically.

The HP LaserJet 4Si MX printer comes out-of-the-box preconfigured for multiple environments. There's nothing more to do than plug-and-play. All interfaces are simultaneously hot, making switching so seamless, end-users won't even notice.

What's more, HP's LaserJet 4Si MX printer is ready to handle whatever needs come down the

that adapts to multiple environments.



pike. More operating systems? No problem. As your network system continues to evolve, the capabilities of this printer are no longer just impressive. They're indispensable.

The HP LaserJet 4Si MX printer is loaded with features that define state-of-the-art. HP's enhanced PCL5 and genuine PostScript™ Level 2 software from Adobe™ come standard. Printer environments are saved while switching. Setup is a cinch with network software utilities and drivers included in the box. And, if you need any reassurance about trouble-free operation, you have it in our Simple Network Management Protocol (SNMP) support.

At 17 ppm, this is the fastest LaserJet ever, with I/Os and RISC-based formatter capabilities matched to support its speed. It delivers impeccable 600 dpi print quality—thanks to HP's microfine toner and Resolution Enhancement technology. Plus, it comes standard with two 500 sheet input trays.

But what if you don't need the full capabilities of the HP LaserJet 4Si MX printer right away? HP offers another printer that's probably a perfect fit. The HP LaserJet 4Si printer delivers the identical 17 ppm performance and superb 600 dpi print quality. It also has room to grow. The two MIO expansion slots let you add

HP JetDirect network interface or third party cards. And you can add on Adobe's genuine PostScript Level 2 software and SIMM memory modules, as you need them.

To find out more about the multiple-network HP LaserJet 4Si MX printer and the upgradable HP LaserJet 4Si printer just call 1-800-LASERJET, Ext. 7299.† Capabilities this advanced make a world of difference—in any environment.



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network. Plus the unique ability to dynamically configure and reconfigure an almost unlimited number (up to 65,000) of autonomous virtual networks with point and click ease — freeing you from the physical constraints of shared networks. And all while delivering the industry's smoothest migration path to full ATM implementation in the future.  So if you need ATM benefits on your Ethernet network today, call 1-800-777-4LAN for a free VNA video and your Dragon information kit.

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Circle Reader Service #12

LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

“In future releases [of NetWare 3.X], we plan to focus on affordability, such as by bundling in services that are separate today.”

Gordon Smith
Senior product marketing manager
Novell, Inc.
Provo, Utah

Netnotes

VisiSoft, Inc. this week is expected to bring out a Network Basic I/O System version of its VisiNet local-area network management software.

Dubbed VisiNet Enterprise Basic, the new software offers administrators an inventory management system for desktops and servers, trouble-ticket reporting, a historical activity log, Simple Network Management Protocol monitoring capabilities as well as other customizable features.

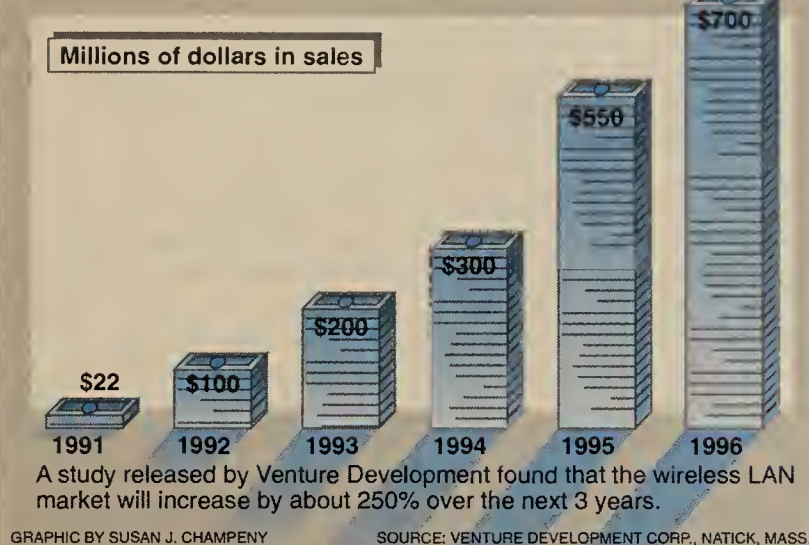
Although these features are also available with the company's existing versions of VisiNet for Novell, Inc. NetWare and Microsoft Corp. LAN Manager nets, the new version will give users these capabilities on IBM LAN Server nets as well as many popular peer-to-peer LANs such as Artisoft, Inc.'s LANtastic.

VisiNet Enterprise Basic is available now for \$795. VisiSoft is based in Atlanta.

Network Peripherals, Inc. this week is expected to bring out new drivers for its SBus line of Fiber Distributed Data Interface adapters that will add support for SunSoft, Inc.'s Solaris operating system. The new software will be packaged with Network Peripherals' driver software for the SunOS operating system.

The company's SBus FDDI
(continued on page 15)

Wireless LANs take off



ALPS offers wireless LAN card for notebooks, laptops

Product targets users of peer-to-peer networks.

By Fredric Paul
Senior Editor

SAN JOSE, Calif. — ALPS Electric USA, Inc. this week plans to introduce its RadioPort/Parallel Wireless LAN adapter, designed for use with notebook and laptop computers.

The company is hoping that ease of use and installation will endear the new RadioPort, a sleek box somewhat smaller than

options are also available.

Using spread-spectrum technology on the 902- to 928-MHz band, three transmission channels and advanced carrier-sense multiple access with collision avoidance technology, the RadioPort supports speeds up to 242K bit/sec at a range of up to 800 feet.

That speed is more than adequate for electronic mail applications, printer sharing and moving small to medium files, Miyano said. Users might notice significant delays if they try to run applications over the wireless connections. The typical network size is eight to 10 users, or 25 users for less intensive applications.

To work with a wide variety of portable, laptop and notebook computers, the RadioPort can be powered by an included AC adapter or via a cable connected to the keyboard output of the computer system. It connects directly to the parallel port, so an expansion slot is not necessary.

An autosensing circuit determines whether the machine has a standard unidirectional parallel port, a bidirectional PS/2-style parallel port or a newly enhanced parallel port, and sets the communication speed accordingly.

The company is working on a RadioPort to attach to network printers so users will be able to use the system for direct wireless printer sharing. There is no pass-through for the parallel port, however, so users cannot print directly while connected to the RadioPort.

(continued on page 15)

Novell devises IPX net registry service

New offering allows users to register IPX names and addresses to avoid intercompany conflicts.

By Caryn Gillooly
Senior Editor

SAN JOSE, Calif. — In another move designed to help its customers build enterprise networks, Novell, Inc. this week will announce establishment of the Novell Network Registry.

The registry is an optional service users can employ to catalog their Internetwork Packet Exchange (IPX) network names and addresses with Novell, which will aid in eliminating conflicts if the registered customers need to communicate with another company that has the same address.

“As NetWare networks are connected into global information systems, our customers have asked us to organize a database of unique network names and addresses, allowing them to participate in worldwide IPX internetworks without address conflicts,” said Navindra Jain, vice president and general manager of Novell's Network Management and Internetworking Products Division, based here.

Today, when an administrator sets up a new NetWare LAN, the IPX address is chosen at random by the administrator, Jain said. In larger organizations with many local-area networks, it has been thus far up to the corporate network administrators to keep track of the addresses to avoid conflict.

Tough to keep track

But as more organizations become decentralized and begin to communicate with one another through electronic mail and other services, it has become more difficult to keep track of all these numbers.

“If there are two John Smiths in one room, it can get confusing; but people can adapt by saying, ‘The John Smith that works at Microsoft,’ or ‘The John Smith that works at Novell,’” Jain said. “But computers are not that smart.”

Today, if a message is sent to a user that happens to have the
(continued on page 14)

Intel intros adapter for high-performance devices

By Caryn Gillooly
Senior Editor

SANTA CLARA, Calif. — Intel Corp. last week introduced a high-performance token-ring card designed for use in network servers and high-end workstations.

TokenExpress EISA/32 is a 32-bit adapter for Extended Industry Standard Architecture-bus machines that supports shielded and unshielded twisted-pair token-ring connections.

Executives at Intel, based here, said the card is tuned for high-performance machines through advances in hardware and drivers.

“First, it's a full 32-bit card; our other cards were all 16-bit,” said Dave Redelfs, product manager for the TokenExpress product line at Intel. “It also uses a busmaster architecture, which is

the fastest way to transmit data across EISA cards.”

The TokenExpress EISA/32 card has 512K bytes of packet-buffer random-access memory, while most other adapters come with only 128K bytes of packet-buffer RAM, Redelfs said. “The more RAM means packets can get into and out of the [card] faster; there's less latency,” Redelfs said.

Tuned drivers are the other reason the cards can be considered high performers.

“We code the drivers to keep the amount of time it takes to execute a transfer to a minimum,” Redelfs explained. “We take out as many wait-states as possible, to tweak the performance as much as possible.”

Other companies also tune their drivers for maximum performance.
(continued on page 15)

Firm furthers networking reach with new card lines

By Fredric Paul
Senior Editor

FOUNTAIN VALLEY, Calif. — Kingston Technology Corp. plans to introduce a line of token-ring interface cards for Micro Channel Architecture and Extended Industry Standard Architecture machines in June, company officials disclosed last week.

These cards will be followed in August by a new generation of Ethernet cards equipped with auto software configuration. "That's where we'll really start to add value," said Ron Seide, director of marketing for Kingston.

Kingston's networking products are compatible with Novell, Inc. NetWare and all Microsoft Corp.'s Network Driver Interface Specification networks, including LAN Manager and Windows for Workgroups, as well as Artisoft, Inc.'s LANtastic.

Kingston's new network cards will expand the line of networking products from the \$250 million private company known mostly for memory and processor upgrades. Kingston entered

the networking arena in March with the introduction of an eight-port "unintelligent" concentrator and the low-end EtherX line of Ethernet cards that require users to manually set jumpers.

The company figures that about 40% of the market demands auto software configuration. Those products sell for between \$129 and \$169, depending on whether they use a 10Base-T, 10Base2 or a combination connection. Kingston hopes to introduce the new products at that price level, while reducing the cost of the existing products.

Earlier this month, Kingston introduced a Pocket Ethernet adapter designed for notebooks and laptops. About the size of a pack of cigarettes, the \$295 product offers a dual interface for either 10Base-T or 10Base2 connections to the network. The Pocket Ethernet Adapter, due out this quarter, attaches to the notebook's parallel port and provides support for enhanced parallel port connections. The Pocket Ethernet Adapter is not compati-

ble with Artisoft LANtastic peer-to-peer networks, Kingston said.

Other Kingston networking products in the works include Fiber Distributed Data Interface capability, Personal Computer Memory Card International Association connections and new concentrator devices, the company said.

Kingston's strategy is to use its experience in commodity businesses, such as memory and processor upgrade cards, to grab a toehold in "working man's networking," Seide said. "We do lots of work in board-level products," he explained, and new networking chips such as the PCNet from Advanced Micro Devices, Inc. are turning networking into "an area that makes sense for us."

To compete with market leaders, Kingston will treat networking products as a commodity, emphasizing availability and low prices for a U.S.-made product with individual testing and a five-year warranty, Seide said. A recent agreement with IBM provides for Big Blue to service Kingston products installed in certain IBM machines under warranty and all Apple Computer, Inc., Compaq Computer Corp. and IBM systems under maintenance contract. □

Novell devises IPX registry

continued from page 13

same address as another user on another network, the network will react unpredictably. "It may send the message to the wrong person, it may send half the message to one and half to the other or you may just get a bunch of error messages," Jain said.

How it works

The registry will basically be a database of NetWare names and addresses that will be kept up by Novell.

Customers setting up NetWare LANs for the first time will call Novell, which will then assign the administrator a block of numbers to use for the new network and for future nets, depending on the growth potential of the company.

Existing customers would call Novell to tell them what numbers are currently being used. If nobody else is using those numbers, Novell will simply register those numbers to that company. But, if those addresses are already listed in the register, the customer will have to modify its address scheme.

Jain admitted this might not be an easy task for existing custom-

ers that need to change their addresses. "This could be a big job," he said.

But customers that need the connectivity said they were willing to make the sacrifice.

"The Novell Network Registry will help us provide an easy migration path for interconnecting our international networks and easily connect our networks to external companies or providers," said Ilans Barz, international telecommunications coordinator for CIBA, a pharmaceutical, biological and chemical company in Switzerland. According to Barz, CIBA has more than 91,000 employees in more than 62 countries.

Jain did stress that the registry is optional, although Novell recommends customers sign up.

"I encourage all NetWare customers who are now inter-networked, or who plan to communicate with other NetWare sites outside their immediate environment, to take advantage of this service," Jain said.

Registration fees start at \$100 and vary according to the number of IPX addresses requested. The service is available now. For more information, users can order a registry package by calling (408) 321-1506. □

3Com's new hub is also a hub, a

It used to be that a hub was a hub. But now there's a hub that will grow and change with you. In more ways than ever.

Introducing the new LinkBuilder® Flexible Media Stack hub family. The most cost-effective alternative to chassis-based hubs, with the flexibility to meet the demands of your network now and years from now.

Every hub in the LinkBuilder FMS™ family is stackable. You can add ports, management capability, and different types of media whenever the need arises.

You can start with 12 ports. Then start stacking. You can connect four units in all, and they'll act as a single, logical repeater. Even if each box features different media. Like coax, 10BASE-T, and fiber.*

Need to add management? Simply buy a single Manage-



ALPS rolls out LAN card

continued from page 13

The most common applications for RadioPort, Miyano said, include temporary work group networks, access to the office local-area network for field personnel, portable networks of notebook computers and use in environments where wiring would be impractical, such as older buildings, historical sites, warehouses and manufacturing "clean rooms."

Although designed primarily for wireless peer-to-peer nets, the RadioPort can also work as an extension to a wired backbone network via a bridge/server equipped with a Proxim, Inc.-compatible wireless network

card.

Available immediately, the RadioPort is priced at \$599, which the company claims is competitive with wireless network adapters that attach to personal computer expansion slots.

The RadioPort is the first in a series of wireless communication products from ALPS Electric USA, which is a wholly owned subsidiary of Alps Electric Co., Ltd., a \$3 billion company based in Tokyo.

ALPS USA recently inked a deal with Qualcomm, Inc. to use its Code Division Multiple Access digital wireless communications technology to develop products, such as digital cellular telephones and low-powered handheld communications devices, integrating both voice and data. ☐

Netnotes

continued from page 13

adapter line supports Sun Microsystems, Inc.'s SPARCcenter 2000 as well as all other single-processor and multiprocessor systems running Solaris 2.1 or 2.2. With the Solaris support, the price of the SBus adapters will remain at \$1,995 for single-attached adapters and \$2,995 for dual-attached adapters.

Conner Storage Systems Group — formerly Maynard Electronics, Inc. — last week added to its data management system for Novell, Inc. networks. The new portion, the Conner 1000MO, is a Small Computer System Interface-based rewritable optical drive, providing up to

1G byte of primary and secondary data storage.

The package costs \$6,495 and is available now. Conner Storage Systems Group, a division of Conner Peripherals, Inc., is based in Lake Mary, Fla.

Solectek Corp. has rolled out its AirLAN line of wireless local-area networking products, which are designed to extend existing wired Ethernet networks.

According to Solectek, based in San Diego, the AirLAN/Bridge is hardware designed to connect existing networks in buildings as far as three miles apart. AirLAN/Internals are wireless adapter cards for indoor use that let users extend existing Ethernet networks within a building, while the AirLAN/Hub is a wireless concentrator that provides added range when extending a cabled network with the AirLAN/Internal adapters. All three components are available now. The AirLAN/Bridge costs \$4,999, AirLAN/Internal cards cost \$799, and the AirLAN/Hub costs \$4,799.

Storage Dimensions, Inc., based in Milpitas, Calif., last week announced new configurations for its LANstor Continua Redundant Array of Inexpensive Disks

(RAID) 5 and LANstor ReFlex modular external systems. The new configurations are based on Storage Dimensions' 1.6G-byte 3½-in. drives.

The new drives feature a 9.5 msec seek time and a 512K-byte read-ahead cache buffer. Data burst rates run up to 10M byte/sec, while sustained rates can hit 4.9M byte/sec. With the new drives, the LANstor Continua (formerly called LANstor Disk Array) can support single-enclosure, fault-tolerant capabilities of 2.1G to 6.4G bytes, the company said. LANstor ReFlex (formerly called LANstor LAN6) offers similar capabilities without the array-processing hardware.

The new configurations are available immediately.

Upsonic, based in Tustin, Calif., last week announced its VR Series of uninterruptible power supply systems for personal computer-based local-area networks. The VR Series uses microtechnology to cut battery usage, increase battery life and speed battery recharges. Available now, the VR series is compatible with all major operating systems, the company said, including OS/2, Macintosh and Unix. Prices range from \$279 to \$949. ☐

Intel intros TokenExpress EISA/32

continued from page 13

formance, Redelfs conceded, but Intel does one final step to give TokenExpress an extra boost.

Drivers in the chip

In addition to the drivers that run in the workstations, there are drivers that run within the chip itself. These are created by the

company that makes the chip — for example, Texas Instruments, Inc. makes chips in the TokenExpress adapters. Therefore, in addition to tweaking their own drivers, Intel tweaks TI's chip drivers to help improve performance.

"If you're a recipe board manufacturer, you can take the [chip-

vendor's] code and put it out as is," Redelfs said. "Or you can improve the source code on the chip itself. We optimize the controller code that runs on the board."

The TokenExpress EISA/32 LAN adapter is available now for \$995. An optional Remote Program Load (RPL) is also available for \$95. The RPL lets administrators boot diskless workstations from the server. ☐

hub, a hub, and a hub.

Add ports



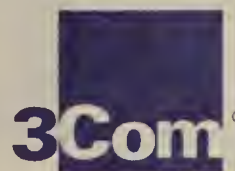
Add management



ment Module to plug into the rear of the bottom unit. The entire stack is now managed.

And to help you get started, we'll give you the management module for just \$199 with the purchase of any three LinkBuilder FMS hubs.

Call 1-800-NET-3Com for details and free information on our hub family and the LinkBuilder FMS special offer. And find out just how flexible a hub can be.



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failure. With forwarding performance that scales to 480,000 packets per second, Wellfleet routers ensure that network congestion never bogs down your users. Finally, our broad router family offers all the connectivity, inter-



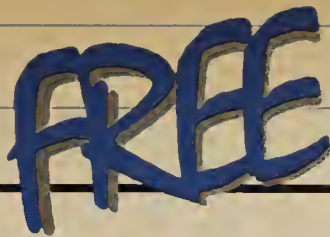
operability and management tools required to integrate IBM networks. For a free copy of our book, *Integrating SNA & Multiprotocol LAN Networks: A Complete Guide*, call 1-800-989-1214, ext. 14.



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Please Answer **ALL** Questions, Sign and Date the Form.

1 Industry: (check one only)

- ☐ 01. Manufacturers (other than Computer/Communications)
- ☐ 02. Finance/Banking
- ☐ 03. Insurance
- ☐ 04. Real Estate
- ☐ 05. Healthcare Services
- ☐ 06. Legal
- ☐ 07. Hospitality
- ☐ 08. Retail/Wholesale Trade/Business Services
- ☐ 09. Transportation
- ☐ 10. Utilities
- ☐ 11. Education
- ☐ 12. Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
- ☐ 13. Government, State/Local
- ☐ 14. Government, Federal
- ☐ 15. Military
- ☐ 16. Aerospace
- ☐ 17. Consultants (Independent)
- ☐ 18. Carriers
- ☐ 19. Interconnects
- ☐ 20. Manufacturers (Computer/Communications)
- ☐ 21. VAR/VAD/VAN/ Systems Houses
- ☐ 22. Distributors, Computer Related
- ☐ 23. Distributors, Communications Related
- ☐ 24. Other

2 What is your job function? (check one only)

NETWORKING MANAGEMENT

- ☐ 1. Networking Mgmt.
- ☐ 3. Datacom/Telecom Mgmt.
- ☐ 2. LAN Mgmt.
- ☐ 4. Engineering Mgmt.

MIS MANAGEMENT

- ☐ 5. MIS, IS, IT Mgmt.
- ☐ 6. Engineering Mgmt.

CORPORATE MANAGEMENT

- ☐ 7. Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)

- ☐ 8. Consultant (Independent)

- ☐ 9. Other

3 My responsibilities include: (check one only)

- ☐ 1. LANs/ Internetworking/ WANs
- ☐ 3. LANs
- ☐ 5. None
- ☐ 2. LANs/ Internetworking
- ☐ 4. WANs

4 What is the total number of sites for which you have purchase influence? (check one only)

- ☐ 1. 100+
- ☐ 3. 20 - 49
- ☐ 5. 2 - 9
- ☐ 7. None
- ☐ 2. 50 - 99
- ☐ 4. 10 - 19
- ☐ 6. 1

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

- | | |
|---|---|
| A. Scope
(check one only) | B. Involvement
(check all that apply) |
| ☐ 1. Corporatewide | ☐ 1. Recommend/Specify |
| ☐ 2. Multienterprise | ☐ 2. Approve |
| ☐ 3. Departmental | ☐ 3. Evaluate |
| | ☐ 4. None (A or B) |

6 Check all that apply in Columns A and B:

- A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

- | | |
|--|--|
| Involved | Plan to Purchase |
| A | B LOCAL-AREA NETWORKS |
| ☐ 01. Local-Area Networks | ☐ 01. Local-Area Networks |
| ☐ 02. LAN Servers | ☐ 02. LAN Servers |
| ☐ 03. LAN Operating Systems Software | ☐ 03. LAN Operating Systems Software |
| ☐ 04. Superservers | ☐ 04. Superservers |
| ☐ 05. Data Base Servers (Oracle, Sybase, etc.) | ☐ 05. Data Base Servers (Oracle, Sybase, etc.) |
| ☐ 06. Terminal Servers | ☐ 06. Terminal Servers |
| ☐ 07. LAN Services | ☐ 07. LAN Services |
| ☐ 08. LAN Storage Devices (optical, tape, disk, etc., including backup systems) | ☐ 08. LAN Storage Devices (optical, tape, disk, etc., including backup systems) |
| ☐ 09. Network Test Equipment | ☐ 09. Network Test Equipment |
| ☐ 10. Hubs | ☐ 10. Hubs |
| ☐ 11. Cables, Connectors, Baluns | ☐ 11. Cables, Connectors, Baluns |
| ☐ 12. UPS | ☐ 12. UPS |
| ☐ 13. Network Adapter Boards | ☐ 13. Network Adapter Boards |
| ☐ 14. Peer-to-Peer LANs | ☐ 14. Peer-to-Peer LANs |
| ☐ 15. Wireless LANs | ☐ 15. Wireless LANs |
| ☐ 16. SNMP Network Management | ☐ 16. SNMP Network Management |
| ☐ 17. ATM (Asynchronous Transfer Mode) | ☐ 17. ATM (Asynchronous Transfer Mode) |

- | | |
|---|---|
| A | B INTERNETWORKING |
| ☐ 18. Bridges | ☐ 18. Bridges |
| ☐ 19. Routers | ☐ 19. Routers |
| ☐ 20. Gateways | ☐ 20. Gateways |
| ☐ 21. Bridge/Routers | ☐ 21. Bridge/Routers |
| ☐ 22. Hubs | ☐ 22. Hubs |
| ☐ 23. Intelligent Hubs | ☐ 23. Intelligent Hubs |
| ☐ 24. Communications Servers | ☐ 24. Communications Servers |

Involved Plan to Purchase

- | | |
|--|--|
| A | B COMPUTERS/PERIPHERALS |
| ☐ 25. Micros/PCs | ☐ 25. Micros/PCs |
| ☐ 26. Minis | ☐ 26. Minis |
| ☐ 27. Mainframes | ☐ 27. Mainframes |
| ☐ 28. Pen-Based | ☐ 28. Pen-Based |
| ☐ 29. Laptops | ☐ 29. Laptops |
| ☐ 30. Workstations | ☐ 30. Workstations |
| ☐ 31. Image Processing Workstations | ☐ 31. Image Processing Workstations |
| ☐ 32. Front-End Processors | ☐ 32. Front-End Processors |
| ☐ 33. Terminals | ☐ 33. Terminals |
| ☐ 34. Printers | ☐ 34. Printers |
| ☐ 35. Cluster Controllers | ☐ 35. Cluster Controllers |
| ☐ 36. Fax Machines | ☐ 36. Fax Machines |
| ☐ 37. X-Terminals | ☐ 37. X-Terminals |

- | | |
|---|---|
| A | B SOFTWARE/APPLICATIONS |
| ☐ 38. Network Management | ☐ 38. Network Management |
| ☐ 39. Micro to Mainframe | ☐ 39. Micro to Mainframe |
| ☐ 40. Security | ☐ 40. Security |
| ☐ 41. Communication/Terminal Emulation | ☐ 41. Communication/Terminal Emulation |
| ☐ 42. Word Processing | ☐ 42. Word Processing |
| ☐ 43. Operating Systems | ☐ 43. Operating Systems |
| ☐ 44. Business Applications (Finance/Mfg/HR) | ☐ 44. Business Applications (Finance/Mfg/HR) |
| ☐ 45. Applications Development | ☐ 45. Applications Development |
| ☐ 46. Data Base Management | ☐ 46. Data Base Management |
| ☐ 47. Spreadsheet | ☐ 47. Spreadsheet |
| ☐ 48. Groupware | ☐ 48. Groupware |
| ☐ 49. EDI | ☐ 49. EDI |
| ☐ 50. E-Mail | ☐ 50. E-Mail |
| ☐ 51. Windows/Graphical User Interface | ☐ 51. Windows/Graphical User Interface |
| ☐ 52. 4GL/Development | ☐ 52. 4GL/Development |
| ☐ 53. Multimedia | ☐ 53. Multimedia |
| ☐ 54. Graphics | ☐ 54. Graphics |
| ☐ 55. Utilities | ☐ 55. Utilities |

A B WIDE-AREA NETWORK EQUIPMENT/SERVICES

- | | |
|---|---|
| ☐ 56. Modems (9.6K bps and over) | ☐ 56. Modems (9.6K bps and over) |
| ☐ 57. Modems (under 9.6K bps) | ☐ 57. Modems (under 9.6K bps) |
| ☐ 58. T-1 | ☐ 58. T-1 |
| ☐ 59. T-3 | ☐ 59. T-3 |
| ☐ 60. Fractional T-1 | ☐ 60. Fractional T-1 |
| ☐ 61. Data Switches | ☐ 61. Data Switches |
| ☐ 62. SMDS | ☐ 62. SMDS |
| ☐ 63. ATM (Asynchronous Transfer Mode) | ☐ 63. ATM (Asynchronous Transfer Mode) |
| ☐ 64. Matrix Switches | ☐ 64. Matrix Switches |
| ☐ 65. Packet Switches | ☐ 65. Packet Switches |
| ☐ 66. Protocol Converters | ☐ 66. Protocol Converters |
| ☐ 67. Diagnostic/Test Equipment | ☐ 67. Diagnostic/Test Equipment |
| ☐ 68. DSU/CSUs | ☐ 68. DSU/CSUs |
| ☐ 69. Microwave | ☐ 69. Microwave |
| ☐ 70. Fax Boards/Modems | ☐ 70. Fax Boards/Modems |
| ☐ 71. VSAT | ☐ 71. VSAT |
| ☐ 72. Fiber Optic | ☐ 72. Fiber Optic |
| ☐ 73. Satellite | ☐ 73. Satellite |
| ☐ 74. ISDN | ☐ 74. ISDN |
| ☐ 75. PBXs (over 1000 lines) | ☐ 75. PBXs (over 1000 lines) |
| ☐ 76. PBXs (under 1000 lines) | ☐ 76. PBXs (under 1000 lines) |
| ☐ 77. Automatic Call Distributors | ☐ 77. Automatic Call Distributors |
| ☐ 78. Voice Messaging Systems | ☐ 78. Voice Messaging Systems |
| ☐ 79. Videoconferencing Systems | ☐ 79. Videoconferencing Systems |
| ☐ 80. Voice Response/Processing | ☐ 80. Voice Response/Processing |
| ☐ 81. Switched Voice | ☐ 81. Switched Voice |
| ☐ 82. Dedicated Leased Line | ☐ 82. Dedicated Leased Line |
| ☐ 83. Switched Data | ☐ 83. Switched Data |
| ☐ 84. Centrex | ☐ 84. Centrex |
| ☐ 85. E-Mail/On-Line Information | ☐ 85. E-Mail/On-Line Information |
| ☐ 86. Image Processing | ☐ 86. Image Processing |
| ☐ 87. Audio Teleconferencing | ☐ 87. Audio Teleconferencing |
| ☐ 88. Local Services | ☐ 88. Local Services |
| ☐ 89. WATS MTs | ☐ 89. WATS MTs |
| ☐ 90. International | ☐ 90. International |
| ☐ 91. Virtual Networks | ☐ 91. Virtual Networks |
| ☐ 92. Frame Relay | ☐ 92. Frame Relay |
| ☐ 93. Value Added Services | ☐ 93. Value Added Services |
| ☐ XX. None of the above (1-93) | ☐ XX. None of the above (1-93) |

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

- | | |
|---|---|
| LANs | Workstations/Nodes |
| A | B |
| ☐ 1. 5,000+ | ☐ 1. 5,000+ |
| ☐ 2. 1,000 - 4,999 | ☐ 2. 1,000 - 4,999 |
| ☐ 3. 100 - 999 | ☐ 3. 100 - 999 |
| ☐ 4. 50 - 99 | ☐ 4. 50 - 99 |
| ☐ 5. 10 - 49 | ☐ 5. 10 - 49 |
| ☐ 6. 9 or Less | ☐ 6. 9 or Less |

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES

- | | |
|---|---|
| Present | Planned |
| ☐ 01. SNA | ☐ 01. SNA |
| ☐ 02. DECNET | ☐ 02. DECNET |
| ☐ 03. MAP/TOP | ☐ 03. MAP/TOP |
| ☐ 04. TCP/IP | ☐ 04. TCP/IP |
| ☐ 05. DCA (Unisys) | ☐ 05. DCA (Unisys) |
| ☐ 06. X.25 | ☐ 06. X.25 |

Present Planned

- | | |
|---|---|
| ☐ 07. NOVELL IPX/SPX | ☐ 07. NOVELL IPX/SPX |
| ☐ 08. APPC/APPN/LU 6.2 | ☐ 08. APPC/APPN/LU 6.2 |
| ☐ 09. NETBIOS | ☐ 09. NETBIOS |
| ☐ 10. OSI | ☐ 10. OSI |
| ☐ 11. APPLETALK | ☐ 11. APPLETALK |
| ☐ 12. OTHER | ☐ 12. OTHER |

LAN OPERATING SYSTEM

- | | |
|--|--|
| ☐ 13. LOCALTALK (APPLETALK) | ☐ 13. LOCALTALK (APPLETALK) |
| ☐ 14. BANYAN (VINES) | ☐ 14. BANYAN (VINES) |
| ☐ 15. DCA (IRMALAN) | ☐ 15. DCA (IRMALAN) |
| ☐ 16. DCA (10-NET) | ☐ 16. DCA (10-NET) |
| ☐ 17. IBM (LAN SERVER) | ☐ 17. IBM (LAN SERVER) |
| ☐ 18. IBM (PC LAN PROGRAM) | ☐ 18. IBM (PC LAN PROGRAM) |
| ☐ 19. MICROSOFT (LAN MANAGER) | ☐ 19. MICROSOFT (LAN MANAGER) |
| ☐ 20. UNGERMANN-BASS (NET/1) | ☐ 20. UNGERMANN-BASS (NET/1) |
| ☐ 21. NOVELL (NETWARE, 2.X, 3.X, 4.X) | ☐ 21. NOVELL (NETWARE, 2.X, 3.X, 4.X) |
| ☐ 22. PROTEON (PRONET) | ☐ 22. PROTEON (PRONET) |
| ☐ 23. SITKA (TOPS) | ☐ 23. SITKA (TOPS) |
| ☐ 24. 3COM (3+, 3+OPEN) | ☐ 24. 3COM (3+, 3+OPEN) |
| ☐ 25. ARTISOFT (LANTASTIC) | ☐ 25. ARTISOFT (LANTASTIC) |
| ☐ 26. HAYES (LANSTEP) | ☐ 26. HAYES (LANSTEP) |
| ☐ 27. DEC (PATHWORKS) | ☐ 27. DEC (PATHWORKS) |
| ☐ 28. OTHER | ☐ 28. OTHER |

LAN ENVIRONMENT

- | | |
|---|---|
| ☐ 29. 4M TOKEN RING | ☐ 29. 4M TOKEN RING |
| ☐ 30. 16M TOKEN RING | ☐ 30. 16M TOKEN RING |
| ☐ 31. ARCNET | ☐ 31. ARCNET |
| ☐ 32. ETHERNET | ☐ 32. ETHERNET |
| ☐ 33. STARLAN | ☐ 33. STARLAN |
| ☐ 34. FDDI | ☐ 34. FDDI |
| ☐ 35. LOCALTALK | ☐ 35. LOCALTALK |
| ☐ 36. 10BASE-T | ☐ 36. 10BASE-T |
| ☐ 37. OTHER | ☐ 37. OTHER |

OPERATING SYSTEM

- | | |
|---|---|
| ☐ 38. DOS | ☐ 38. DOS |
| ☐ 39. UNIX/XENIX/AIX | ☐ 39. UNIX/XENIX/AIX |
| ☐ 40. OS/2 | ☐ 40. OS/2 |
| ☐ 41. OS/2 2.X | ☐ 41. OS/2 2.X |
| ☐ 42. MVS | ☐ 42. MVS |
| ☐ 43. VM | ☐ 43. VM |
| ☐ 44. VMS | ☐ 44. VMS |
| ☐ 45. MACINTOSH | ☐ 45. MACINTOSH |
| ☐ 46. WINDOWS | ☐ 46. WINDOWS |
| ☐ N/A 47. WINDOWS NT | ☐ N/A 47. WINDOWS NT |
| ☐ 48. X WINDOWS | ☐ 48. X WINDOWS |
| ☐ 49. OTHER | ☐ 49. OTHER |

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- | | |
|---|---|
| ☐ 1. Europe | ☐ 4. Australia |
| ☐ 2. Asia | ☐ 5. Middle East |
| ☐ 3. South America | ☐ 6. None |

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER	☐	☐	☐	☐

MICROCOMPUTERS

(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

- A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

- | | |
|--|--|
| A | B |
| ☐ 1. \$100 million and over | ☐ 1. \$100 million and over |
| ☐ 2. \$50 - \$99.9 million | ☐ 2. \$50 - \$99.9 million |
| ☐ 3. \$25 - \$49.9 million | ☐ 3. \$25 - \$49.9 million |
| ☐ 4. \$20 - \$24.9 million | ☐ 4. \$20 - \$24.9 million |
| ☐ 5. \$10 - \$19.9 million | ☐ 5. \$10 - \$19.9 million |
| ☐ 6. \$5 - \$9.9 million | ☐ 6. \$5 - \$9.9 million |
| ☐ 7. \$1 - \$4.9 million | ☐ 7. \$1 - \$4.9 million |
| ☐ 8. \$500,000 - \$999,999 | ☐ 8. \$500,000 - \$999,999 |
| ☐ 9. \$499,999 or less | ☐ 9. \$499,999 or less |

12 Estimated gross annual revenue of your entire company/institution: (check one only)

- | | |
|--|--|
| ☐ 1. Over \$10 billion | ☐ 5. \$50 to \$99.9 million |
| ☐ 2. \$1 to \$9.9 billion | ☐ 6. \$10 to \$49.9 million |
| ☐ 3. \$500 to \$999.9 million | ☐ 7. \$5 to \$9.9 million |
| ☐ 4. \$100 to \$499.9 million | ☐ 8. \$4.9 million or less |

13 Estimated number of employees for your entire corporation:

- | | |
|---|---|
| ☐ 1. Over 10,000 | ☐ 4. 1,000 - 2,499 |
| ☐ 2. 5,000 - 9,999 | ☐ 5. 500 - 999 |
| ☐ 3. 2,500 - 4,999 | ☐ 6. 499 or less |

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

“For the time being, the pairing of [SNA and LAN traffic on a single network] is more in the frictional, crash-bang-wallop mold of a ‘Tom and Jerry’ cartoon than the homogeneous serenity of a Barbie and Ken dollhouse.”

Anura Guruge

Independent strategic consultant
New Ipswich, N.H.

Link Notes

Wellfleet Communications, Inc. last week announced the opening of a Canadian subsidiary in Toronto, with a second office scheduled to open in Ottawa next month. Wellfleet Communications Canada will provide expanded technical and sales support to the vendor's distributor and value-added resellers in the Canadian provinces.

In a related matter, Wellfleet also announced a comarketing agreement with **Bell South Corp.** whereby the regional Bell holding company will offer Wellfleet's entire line of routers in conjunction with the carrier's frame relay and Switched Multimegabit Data Services.

Datability, Inc. last week announced that it has licensed all of Clearpoint Research Corp.'s internetworking technology on a nonexclusive basis.

All the bridge and router products previously available from Clearpoint, which closed its doors early last month, will now be available through Datability.

The company also announced (continued on page 19)

Dayna unveils high-density hub geared to Macintoshes

AppleTalk pack lets managers monitor devices.

By Skip MacAskill
Senior Writer

SALT LAKE CITY — Dayna Communications, Inc. last week rolled out a high-density version of its network hub that provides Ethernet connectivity for Macintosh work group and departmental local-area networks.

The new DaynaStar Hub-24, a 24-port 10Base-T hub that comes bundled with the company's AppleTalk monitoring software, gives net managers a centralized view of the status and performance of their AppleTalk nets. Previously, Dayna had offered eight- and 12-port versions.

The hub, which comes equipped with 24 RJ-45 ports or two RJ-21 telephone company-type connectors, has a continuously active attachment unit interface and BNC ports that allow connection to both thin- and thick-wire Ethernet backbones simultaneously.

Two extra RJ-45 ports also give users the option of cascading as many as three Hub-24s, thus

supporting as many as 72 users.

The hub offers an autopartitioning feature that is designed to automatically turn off a port when it is experiencing excessive network traffic errors, thereby partitioning the faulty node and keeping the rest of the network running.

Taking Vital Signs

Included with the hub is Dayna's Network Vital Signs AppleTalk software, which runs in the background on any Macintosh and monitors the net for status changes on a variety of network devices, including file servers and routers.

The software allows the net manager to set alarm thresholds on any device on the network. Once this preset condition is reached, a visual or audio alarm can be sent to the net administrator's management console.

The DaynaStar Hub-24 is available now. It is priced at \$1,399, which includes the Network Vital Signs software. ■

Olicom ups performance of token-ring bridge line

By Maureen Molloy
Senior Editor

DALLAS — Olicom USA, Inc. last week announced new software for its token-ring bridges and local-area network adapters that will provide a twofold performance boost over existing wares.

The new PowerMAC, when used on Olicom's stand-alone Wire Speed Local Bridge 16/4 token-ring bridge, will enable users to achieve maximum throughput of 27K packet/sec using 64-byte packets — up from the existing speed of 13K packet/sec. Novell, Inc. plans to license the software for its personal computer-based NetWare Multiprotocol Router software, enabling it to double throughput.

When used on Olicom's Extended Industry Standard Architecture (EISA) adapter cards, the PowerMAC driver will enable PC users running NetWare to boost throughput without putting increased demands on the CPU. The

PowerMAC achieves throughput speeds of more than 19K packet/sec for 64-byte packets, up from existing maximum speeds of less than 10K packet/sec.

The PowerMAC capabilities were recently tested by LANQuest Labs, an independent testing facility in San Jose, Calif., using Novell's NetWare MultiProtocol Router Benchmark.

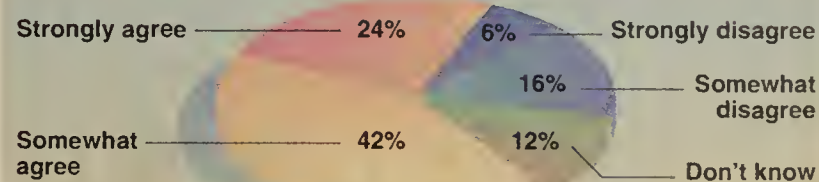
The test bed included four Olicom EISA 16/4 Server Adapters installed in a Compaq Computer Corp. DeskPro 66M PC running the new PowerMAC drivers. Results showed that the PowerMAC supported throughput speeds for Internetwork Packet Exchange (IPX) traffic in excess of 19.4K bit/sec.

The PowerMAC driver for the NetWare 3.11 Server ODI is available now with Olicom's EISA 16/4 Server Adapter as well as on its Wire Speed Local Bridge 16/4.

There is no cost for the PowerMAC upgrade. ■

Integrating nets using hubs

Intelligent hubs will play an integral role in your company's efforts to integrate LANs:



Figures are based on a survey of 200 MIS executives from some of the largest U.S. corporations.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

AMS selects Bytex hubs for net upgrade

Firm chose to swap IBM 8228s for Bytex hubs, based on capabilities such as fault management.

By Maureen Molloy
Senior Editor

ARLINGTON, Va. — American Management Systems, Inc. (AMS) last week awarded a contract to Bytex Corp. for more than 50 Series 7700 Intelligent Switching hubs that it will use to rein in management control of its growing LAN-internet.

The hubs will replace IBM 8228 multiaccess units and be tied to Wellfleet Communications, Inc. routers in a collapsed backbone architecture designed to accommodate the growth of AMS' sprawling internet.

The hubs, installed on each floor of the firm's headquarters here and in a new building the firm recently opened in Fairfax, Va., will link more than 3,000 users. Ed Ward, AMS' manager of network services, said the per-port switching and fault management capabilities are what sold him on Bytex.

“Our business is very decentralized, and we have many different groups working on different projects and many users moving frequently between projects,” he said. “Our two greatest requirements were for configuration and fault management.”

Two Wellfleet Concentrator Node routers will anchor the collapsed backbone — the backplane buses acting as the network backbone — and will be fronted by two Bytex hubs.

Cables will fan out from these master hubs — which can support a maximum of 32 token-ring and three Ethernet local-area networks — to Bytex hubs in wiring closets on the other floors of

each building. The headquarters has 14 floors, while the new Fairfax facility has 12.

The latter building will be linked to the company headquarters via a fiber-optic cable supporting a 16M bit/sec link provided by its local carrier. That fiber will eventually be boosted to speeds exceeding 100M bit/sec, according to Ward.

Users in AMS' 29 remote sites will be linked to the headquarters

“Our two greatest requirements were for configuration and fault management,”
AMS' Ed Ward
said.

▲▲▲

via routers through the backbone routers.

Currently, AMS has separate Ethernet and token-ring backbones at its headquarters that attach LANs to local servers or feed traffic to an IBM host. Remote traffic from more than 10 remote sites is bridged via Microcom, Inc. LANBridges to the mainframe.

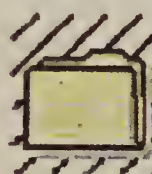
“When we started studying the network requirements for the new building, we decided we didn't want our existing architecture,” Ward said. “With the complexity of internetworking and (continued on page 19)

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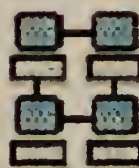
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GLOBAL SERVICES

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Worth Noting

If carriers could find a way to spread their ATM expenses across the residential customer base, businesses would be able to piggyback traffic on the networks with no incremental cost to the carrier."

Tom Nolle
President
CIMI Corp.
Voorhees, N.J.

Konica drops leased lines in favor of frame relay net

WilTel's service to provide performance benefits.

By Christopher Finn
Special to Network World

WINDSOR, Conn. — Faced with the enormous cost of upgrading its 9.6K bit/sec IBM Systems Network Architecture leased-line network to 56K bit/sec, Konica Business Machines USA, Inc. decided instead to migrate to a nationwide frame relay network provided by WilTel.

Konica's 9.6K bit/sec SNA network tied 48 remote locations with various 3270-type terminals to a mainframe at its corporate headquarters here.

The leases on the existing equipment were due to expire just as the need for a higher speed network was becoming apparent, said Brian Spear, manager of information technologies at Konica.

"It became obvious that we needed to move to a multiprotocol network," he said. "This gave us the chance to wipe the slate clean and position [ourselves] to move away from SNA in the long term." The main issues for Spear were cost and performance.

"Not only did this [frame relay] solution cost less," said Spear, "but we also decreased our transaction time from three to 12 seconds, to 0.4 second."

Konica's new network will serve all 48 locations when completed in mid-June. Nine connections are functional already. Each branch location contains a new 16M bit/sec IBM Token-Ring local-area network running OS/2 and are connected to the main location through an IBM 6611 router. Konica uses the Network Basic I/O System as its network operating system.

Konica's remote sites are tied to the headquarters here via permanent virtual circuits with a 56K bit/sec committed information rate. The company's headquarters is linked to the frame relay cloud with two 1.536M bit/sec frame relay ports.

"The response time for our transactions on the network have become so fast that productivity has increased," Spear said. "We have already seen a 15% increase in the volume of transactions over the previous network."

The IBM 6611 routers have been a key to the network's success, according to Spear. Konica has vastly reduced the polling overhead on the wide-area network by performing that function locally once the connection is established. This is provided by the

(continued on page 22)

SW Bell waives ISDN PRI service installation fees

By Bob Wallace
Senior Editor

ST. LOUIS — Southwestern Bell Corp. last week said it is waiving installation charges for users in three states that implement Integrated Services Digital Network Primary Rate Interface (PRI) service.

The promotion, designed to boost use of PRI, will run until year end and can save new users between \$1,500 and \$2,500 per 1.544M bit/sec link. The promotion is available in Arkansas, Kansas and Missouri, and will be extended to firms in Oklahoma and Texas, pending approval from regulators in each state.

"We're looking to jump-start ISDN," says Mike Reddout, Smart-Trunk marketing manager for

Southwestern Bell. "We have seven customers now and hope to increase that to 30 by year end."

Southwestern Bell began selling its Smart-Trunk ISDN PRI service in July 1992 in Kansas and, shortly thereafter, to companies in Arkansas and Missouri.

PRI supports digitized voice or circuit-switched data over 23 64K bit/sec channels and signaling information and packetized data over a single 64K bit/sec channel.

In Missouri, the regional Bell holding company offers Smart-Trunk service with an added-cost disaster recovery feature called Loop Protection Option, which automatically reroutes traffic over a secondary path if the first is knocked out. ■

TCI plans massive fiber deployment

The project at a glance

TCI will spend more than \$1.9 billion to build fiber metropolitan-area networks serving 400 communities by year-end 1996.

The company will deploy 7,000 route miles of fiber in 1993 alone, with each fiber route consisting of a 24-strand cable.

TCI is creating 4 regional superhubs in:

- Pittsburgh
- South Florida/Miami
- Denver
- San Francisco Bay Area

4 more hubs are scheduled to be installed in:

- Chicago
- Hartford, Conn.
- Salt Lake City
- St. Louis

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: TELE-COMMUNICATIONS, INC., ENGLEWOOD, COLO.

TCI outlines \$1.9b net upgrade project

Will migrate from coaxial cable to fiber in race to build infrastructure for next-generation services.

By Bob Wallace
Senior Editor

ENGLEWOOD, Colo. — Tele-Communications, Inc. (TCI), the nation's largest cable television company, detailed plans last week to upgrade its coaxial cable plant over the next four years by adding fiber links at an estimated cost of more than \$1.9 billion.

The ambitious project is yet another step toward a looming confrontation between CATV companies and local exchange carriers, both of which are racing to lay the groundwork for the delivery of future communications services such as interactive TV.

Last December, New Jersey Bell Telephone Co. detailed a \$1.5 billion project under which it proposed installing fiber throughout its network in return for greater regulatory freedom.

More service

TCI said that migrating from its existing analog coaxial cable local distribution system to fiber will enable it to deliver a wide array of high-bandwidth home shopping, interactive video and information services to the 10.2 million households the CATV company serves.

"Extending fiber to the neighborhood will enable us to deliver new consumer services while improving the quality and reliability of existing [offerings]," said Bob Thomson, senior vice president of communications and policy planning for TCI. "It's the next step in our network evolution."

TCI's current network is based on analog satellite and coaxial ca-

ble technology. Traffic is broadcast via satellite from a central site to very small aperture terminals in the communities served. The signals are then distributed over TCI-owned coaxial cable in service areas consisting of 500 to 2,000 dwellings.

TCI said it will install 7,000 route miles of fiber, with each route consisting of a fiber cable containing an average of 24 fiber strands. At completion, 168,000

"Extending fiber to the neighborhood will enable us to deliver new consumer services."

▲▲▲

miles of fiber will have been installed. It will cost the company \$750 million this year to run fiber to 100 areas; the company plans to run it to 250 areas by 1996.

The signals will still be distributed by satellite to eight different hubs, and fiber will run from there out to the individual service areas where coaxial cable is used.

Superhubs

TCI has already begun creating four so-called superhubs. The superhubs will be located in Denver; Pittsburgh; South Florida/Miami; and the San Francisco Bay Area

(continued on page 22)

Carrier Watch

AT&T last week expanded the global reach of its Global Software-Defined Network service to four new countries — Korea, New Zealand, Switzerland and Taiwan.

With the extension, the service is available in 20 countries. Global SDN enables multinationals to build a single virtual voice network for sites here and abroad. The global network, which supports a uniform seven-digit dialing plan, also enables off-net locations to dial into the network using a special 800 number.

AT&T said Global SDN can be substantially less expensive than International Direct Distance Dialing (IDDD) rates and is best suited for multinationals with two or more hours of international interoffice calls daily.

The global network is now offered through Taiwan's International Telecommunications Administration, Korea Telecom, Telecom New Zealand and the Swiss PTT, according to AT&T.

For instance, the rate for a 4½-minute Global SDN call of the same length from the U.S. to Switzerland during the peak time period is \$4.41 vs. \$5.76 via an IDDD call, for a savings of 23%. ■

TCI outlines \$1.9b net upgrade project

continued from page 21

Area, with four more superhubs planned for Chicago; Hartford, Conn.; Salt Lake City; and St. Louis.

Creating the superhubs requires TCI to centralize a wide array of equipment currently scattered throughout its local distribution systems such as head-ends. The move to fiber will also enable the firm to eliminate signal regeneration equipment needed to boost electrical signals as well as

signal modulators.

TCI is creating smaller hubs in less dense cities nationwide. The firm estimates that 90% of its 10 million customers will be served by the new network before 1996.

"We believe this project is the largest private-sector telecommunications undertaking in our nation's history, considering the number of customers involved and the relatively short time frame," said Brendan Clouston, chief operating officer at TCI.

TCI's decision to deploy the fiber — coupled with the decision to use digital

compression — will boost TCI's network to 750 MHz, giving the company the capacity "to handle virtually every advanced service customers may want well into the next century," Thomson said.

Increased channels

Today's average 450-MHz cable system typically carries 54 channels of analog TV programming. With digital compression, this total could eventually surpass 500 channels, depending on customer demand for the new optional services.

"We gain the ability to reach the giga-

hertz level, which is essential for high-speed computer traffic and other large-scale data transfers," said Richard Rexroat, vice president of engineering for TCI Cable Management Corp., the company's domestic cable operations subsidiary.

The company said it will consider making capacity on its fiber routes available to alternative access service providers to link user sites to long-haul carriers' points of presence. TCI owns a 30% stake in one such alternative carrier, Teleport Communications Group (TCG). TCG said it would consider leasing capacity in order to access markets that lack competition in the local loop.

In planning this project, TCI capitalized on the fact that the cost of fiber has declined 11% since 1990, while the cost of the required equipment has dropped by 40%. These developments make it more economical for TCI to begin a systemwide reengineering project. **Z**

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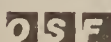
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Konica drops leased lines for frame relay

continued from page 21

IBM 6611's Data Link Switching capability.

The move to frame relay was fairly easy, Spear said. He is preconfiguring the Token-Ring equipment here and shipping it directly to the remote sites.

"They just take it out of the box and plug it in," he said. "The biggest problem is logistics, not technical issues."

Where early frame relay users have complained about long installation periods, Spear said the wide-area implementation has been relatively painfree with WilTel. "We are bringing up five locations a week at this point," he said. "That's fast."

Konica considered many frame relay

Where early frame relay users have complained about long installation periods, Spear said the wide-area implementation has been relatively painfree with WilTel.



providers but chose WilTel based on its experience. "It was obvious that WilTel did their homework and knew what they were doing," Spear said. "They had experience on actual networks, and that showed."

Despite a total changeover of equipment and transmission services, users have not noticed any differences other than the improved performance.

"The key thing is that we are still running the same applications," Spear said.

"Each location got a day's worth of training on OS/2, and that was about it," he said. "Now we are running them over a much more modern multiprotocol platform, which is going to take us beyond SNA." **Z**

Finn is an associate with TeleChoice, Inc., a Verona, N.J., consultancy.



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Circle Reader Service #10

Attachmate upgrades DOS 3270 to give users advanced functions

By Michael Cooney
Senior Editor

BELLEVUE, Wash. — Attachmate Corp. last week unwrapped Version 3.0 of its Extra Extended for DOS 3270-emulation software, which supports NetView alerts, offers improved remote access capabilities and adds automation features that give

3270 users more control over host links.

"These enhancements will give more advanced functions and help users who aren't ready to move to Windows or OS/2," said Stuart Lisk, product marketing manager at Attachmate.

The software can now deliver alerts directly to NetView, IBM's host-based net-

work management facility. In the past, Extra Extended workstations had to send alerts through a gateway or controller.

NetView operators were, however, unable to determine which station was having a problem with that method, Lisk said. "Now users can monitor and more precisely control their 3270 Extra workstations."

A NetView operator can access the Response Time Monitor within the Extra Extended workstation to measure application or file-transfer response times at the desktop.

For those Extra Extended users wanting

to access the mainframe remotely, Attachmate added support for the full-duplex Asynchronous Data Link Control (ADLC) protocol, known as X-ADLC. With X-ADLC, users can dial into a mainframe using a modem at speeds of up to 19.2K bit/sec. Users can dial in over standard telephone lines or link through an X.25 net.

In the past, Extra Extended supported a half-duplex ADLC protocol for remote access. "The X-ADLC protocol is especially efficient for users on packet networks because it eliminates the polling done by half-duplex devices," Lisk said. "That saves the pay-per-byte costs charged on many packet networks."

Attachmate also integrated its Now automation scripting language into the Extra Extended 3.0 software. Previously a separate \$195 product, Now lets users write scripts that can support unattended file transfers. "Users can now build their own file-transfer applications and customize them to run when and where they want in their enterprise," Lisk said.

Extra Extended for DOS will ship by the end of the month for \$425. Existing users can upgrade for \$75. ■

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By MOTOROLA

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Mainframe giant tests client/server

continued from page 9

Osiris will initially let Unix clients use the HDS mainframe as a storage device, although the firm is planning to bring out future enhancements in phases. "The more LANs you link, the more storage capacity you need," said Brian Walsh, vice president of marketing at HDS here. "Applications like imaging are pushing the limits of LAN-based storage devices."

HDS has signed an agreement with Epoch Systems, Inc. to provide a data storage manager that will let a LAN administrator keep track of the data on the mainframe, as well as provide backup and recovery capabilities. Although details were unavailable, the data storage manager is expected to ship in the fourth quarter.

The next phase will be to let LAN users employ the mainframe as a database server. According to Walsh, Oracle Corp. has said it plans to roll out a version of its new Oracle 7 database management system for OSF/1, which means it will be able to run on HDS' new HI-OSF/1-M OSF-compliant operating system. The Oracle product is expected to be available during first-quarter 1994.

In the third phase, HDS plans to provide a capability allowing the mainframe to be used as an on-line transaction processing server. Walsh said the company plans to add this capability by the end of next year but declined to provide further details.

According to analysts, HDS users should welcome Osiris. "Over 50% of enterprise data is distributed throughout the network, and most is fairly unmanaged and not backed up," said James Castle, an analyst at Gartner Group, Inc., a research and consulting firm in Stamford, Conn. "If nothing else, customers need a place for the net data to be stored and backed up."

However, he added that the announcement is limited to HDS customers. "This supports all the appropriate protocols — but, bottom line, it only connects to their mainframes," he said. ■

ENTERPRISE APPLICATIONS

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Worth Noting

“It’s oxymoronic to suggest that a groupware product can be constrained to a single operating system or hardware platform.”

Jeffrey Papows
Vice president
Notes Products Division
Lotus Development Corp.
Cambridge, Mass.

Store & Forward

Sybase, Inc., an Emeryville, Calif., database vendor, last week announced an expanded service and support strategy in conjunction with the opening of its newest support center in Burlington, Mass.

The support plan includes a greater global presence with the addition of new support centers in Switzerland, the Netherlands and Japan.

Sybase has also introduced a new number, (800) 879-2273, to provide users with a single source of support information. In addition, Sybase has implemented a support system at its offices that is based on its own software in order to access information in real time from anywhere on the company’s network.

Informix Software, Inc., a Menlo Park, Calif., vendor of database management system software, has signed an agreement with SAP AG to integrate the Informix-OnLine database server with SAP’s R/3 client/server application software. Under the agreement, Walldorf, Germany-based SAP will become an Informix reseller via its SAP America subsidiary, which is based in Philadelphia.

The SAP applications designed to run on Informix-OnLine will be available in July. ■

Military parts distributor axes Big Blue mainframe

Saves thousands by moving to NetWare LAN.

By **Wayne Eckerson**
Senior Editor

MINNEAPOLIS — For a company that tracks information about more than a million parts, there is one part that Napco International, Inc. definitely did not want — the mainframe.

Last July, the worldwide distributor of U.S. military vehicle parts, based here, pulled the plug on its IBM mainframe and now bankrolls approximately \$300,000 a year in cost savings.

In place of the mainframe, Napco implemented a Novell, Inc. NetWare local-area network, which supports 90 DOS and Windows-based personal computers and a Tricord Systems, Inc. PowerFrame superserver with a 16G-byte hard disk. The superserver runs a Novell Btrieve database, which supports Napco’s huge inventory of military parts.

Napco spent one year rewriting all of its mainframe applications — including purchasing, order/entry, inquiry/quote and almost a dozen others — to run on the NetWare LAN using a client/server development tool from Magic Software Enterprises,

Inc. in Irvine, Calif.

Magic, a flexible, table-driven development tool by Magic, frees developers from writing code. Magic also gives developers the flexibility to build applications in one operating environment and deploy it in another.

Magic supports DOS, Windows, most implementations of Unix and Digital Equipment Corp.’s VAX/VMS and Alpha. It also handles a range of database management systems and runs on most LANs.

According to Gary Rappaport, chairman of Venturian Corp., Napco’s parent company, downsizing to a client/server platform has enabled Napco to eliminate \$130,000 a year in licensing, service and support contracts for the mainframe. It also has enabled it to avert a huge capital outlay of \$300,000 for a new host-based purchasing system as well as slim down its information systems staff by 3½ people for additional annual cost savings.

He estimated that the firm spent between \$600,000 and \$700,000 over a two-year period (continued on page 29)

Sterling Software carves electronic commerce niche

By **Bob Brown**
Senior Editor

DUBLIN, Ohio — Sterling Software, Inc.’s EDI Group last week announced that it has revamped its electronic data interchange network service to add support for standards-based electronic mail.

The service, renamed Commerce Connection, is based on the company’s existing Ordernet EDI network. Support has been added for the 1988 X.400 E-mail standard and other electronic commerce services such as electronic libraries, said Bob O’Malley, director of advanced electronic commerce products for Sterling Software.

Sterling Software, a leading player in the EDI software and services markets, is scheduled to announce Commerce Connection at the EDI ’93 Conference & Ex-

hibit sponsored by the Data Interchange Standards Association, Inc. in San Antonio, Texas.

Thanks to the new X.400 support, users of any X.400-based E-mail network or system will now be able to communicate through the Sterling Software network.

The company will also begin offering a new graphical user interface-based software package, dubbed Commerce Connection for the PC, that will support E-mail, EDI and library service interaction over the network. Sterling Software’s existing series of EDI services, including EDI/LaserMail, Carbon Copy and EDI/Fax will continue to be supported on Commerce Connection.

The network is based on physical links provided by other carriers and anchored by a switching (continued on page 29)

Powersoft vs. Gupta

Two leading Windows application development tools square off.

Company	<i>Gupta</i>	Powersoft
Product	PowerBuilder	SQLWindows
Currently shipping	Version 2.0 (Version 3.0 in final beta)	Version 4.0
Pricing	\$1,495 to \$3,895 depending on databases supported	\$1,995 (standard edition) to \$3,495 (corporate edition)
Unique features	DataWindow for accessing database information without having to code SQL statements; fully graphical, point-and-click development environment.	Collaborative programming using data dictionary repository; integrated SQL database.
Strategic alliances	Bachman Information Systems, Inc., Ernst & Young, LBMS, Inc., Novell, Inc.	Hewlett-Packard Co., IBM, Mitsubishi, Novell, Price Waterhouse

GRAPHIC BY TERRI MITCHELL

SOURCE: POWERSOFT CORP., BURLINGTON, MASS. AND GUPTA CORP., MENLO PARK, CALIF.

Gupta, Powersoft camps square off

Some consider SQLWindows, PowerBuilder to be equal, while others find one beats out the other.

By **Wayne Eckerson**
Senior Editor

Two of the hottest products for developing Windows-based client/server applications are Powersoft Corp.’s PowerBuilder and Gupta Corp.’s SQLWindows.

Leveraging the popularity of Microsoft Corp.’s Windows and the corporate scramble to downsize mainframe applications to client/server platforms, Powersoft and Gupta have enjoyed success with their tools and are now considered leaders in the graphical application development market.

Matter of preference

When compared head-to-head, the products exhibit more similarities than differences, and most users consider the tools equally good for rapidly building graphical client/server applications.

“In terms of being able to throw together a system, both are equally adept,” said Brad Cooley, manager of systems support in the agricultural division of Ciba-Geigy Corp. in Greensboro, N.C. “It’s a matter of preference.”

However, developers who have tested both PowerBuilder and SQLWindows have definite reasons for selecting one tool over another, or, in some cases, dumping both products in favor of other Windows-based client/

server development tools.

PowerBuilder proponents generally favor the tool because it is easy to learn and offers a fully point-and-click graphical development environment. This frees developers from writing code or needing to know anything about SQL.

Rik Brooks, senior programmer/analyst at U.S. Intelco Networks, Inc. in Olympia, Wash., said PowerBuilder’s intuitive, ob-

“In terms of being able to throw together a system, both are equally adept,” Cooley said.

▲▲▲

ject-oriented graphical environment enables new developers to get up-to-speed in less than a week. He added that it is faster to produce programs using PowerBuilder because it never requires a developer to write code.

“[Gupta’s] SQLWindows forces you to repeatedly switch programming paradigms from point-and-click to coding, which is terrible for productivity,” (continued on page 30)

IBM polishes 3172 for high-speed nets

continued from page 9

eventually will use it to address other nodes across an SMDS network," said Al Brandt, program manager for the 3172. "We see SMDS support as a first step to ATM in the future."

Brandt said IBM has not set a time frame for the SMDS product or ATM support.

Also on the 3172's future schedule is support for an ESCON Director, which will provide dynamic switching functions for

downstream communications devices. That would enable the controller to direct communications to multiple hosts or multiple partitions on one mainframe. Currently, a LAN linked to a 3172 is limited to one host or partition on the host.

ESCON Director support could be added by the end of this year, analysts said.

Brandt indicated that IBM may soon bring out 3172 adapter cards that will support multiple LAN types. Current cards are

dedicated to one LAN type.

For example, the new boards would let users link Token-Ring, Ethernet and FDDI LANs and run Systems Network Architecture and Transmission Control Protocol/Internet Protocol data together over one adapter.

Brandt also said IBM is thinking about adding full FDDI support to the 3172 soon. FDDI support today is found only on the 3172 Model 3 running IBM's TCP/IP Off-load feature.

On the 3172's TCP/IP support side, IBM said it would increase the number of

TCP/IP Telnet sessions the 3172-host complex could handle. Currently, the 3172 can handle 2,000 Telnet sessions.

Brandt gave no indication of how many more sessions the box would support. "We are working to create a flexible, versatile platform that will fit many users' LAN connectivity needs," he said. "We are evaluating customer requirements to see what features they want first." ■

Micom unwraps mux with data, fax, voice

continued from page 9

York has been trialing a Marathon 10K network since January. The voice-switching capability of the Marathon network is saving the company \$5,000 a month in international dialing by enabling it to bypass the public-switched network, said Jay Schroads, director of information systems at Transammonia.

Analysts say the Marathon 10K, running Total Connectivity, gives Micom a leg up on competitors such as Data Race, Inc. and Republic Telecom Systems Corp.

"Not all of Micom's competitors offer the total solution," said Curtis Price of International Data Corp. in Framingham, Mass. "They either offer voice switching or data switching. The ability for them to do both is going to be a big boon for them."

Micom also unwrapped management software, called NetMan, for Marathon networks. NetMan runs on an i386- or i486-based personal computer under The Santa Cruz Operation, Inc.'s SCO Unix. It displays the topology of Marathon networks on a color monitor and allows users to perform configuration management, alarm and event reporting, diagnostics and statistics gathering for as many as 250 Marathon nodes.

Pricing for Marathon 10K starts at \$3,950. Total Connectivity software costs \$250 in upgrade packages for Marathon 1K and 5K users, while voice/fax switching costs \$250 per channel. The software will be free for new Marathon customers. Pricing for the NetMan management system starts at \$900. All products will be available in May. ■

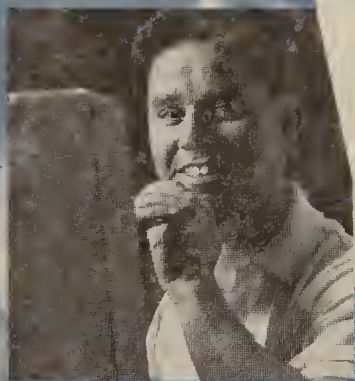
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NETWORK WORLD'S



READER ADVOCACY FORCE

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

“We have some situations in electronic messaging that are straight out of horror magazines. We’re talking about Pentagon E-mail, where we’re more than 78% non-[Government OSI Profile]-compliant.”

Army Gen. Alonzo Short
Director
Defense Information Systems
Agency

People & Positions

As part of Ameritech’s ground-up reorganization, it appointed a new tier of vice presidents — culled from executives at Ameritech’s local exchange carriers — to head up operations at its company-wide business units.

At the custom business services are **Steve McCarthy**, vice president of marketing; **Lana Porter**, vice president of sales operations; and **Michael Tatom**, vice president of service operations.

Enhanced business services will run under **Bronson Haase**, vice president of business sales, and **Ethel Muhammad**, vice president of operations.

At information industry services will be **Carol Scheff**, vice president of network provider services; **Dwayne Goldsmith**, vice president of information provider services; and **Steve Parrish**, vice president of business development in interconnection and personal communications nets.

From telephone industry services are **Jeffrey Childs**, vice president of marketing and sales, and **Michael Robb**, vice president of access management. ■

Sterling Software finds fit with Systems Center

Sterling offers needed funds for product investment.

By Bob Brown
Senior Editor

DALLAS — Sterling Software, Inc.’s recently proposed \$185 million acquisition of Systems Center, Inc. is being hailed by industry observers as a break for Systems Center customers and a good fit for the two companies.

Systems Center has struggled financially since buying the NetMaster net management product — an alternative to IBM’s NetView — from Australian firm Cincom Systems, Inc. in 1990. Sterling Software offers financial stability, a successful acquisition record and the funds to fuel investment in product development.

“Systems Center has been on the block for a while, and the general feeling is that this acquisition should give them more funding for the initiatives they are involved in,” said Bruce Allen, a vice president and service director at META Group, a Westport, Conn., market research firm.

“Systems Center now has the

ability to leverage its NetMaster installed base to try to sell what should prove to be an even bigger business — it’s Solve system management products,” he explained.

Joe Mohen, vice president of strategic planning at Proginet Corp., a Uniondale, N.Y., vendor of multiprotocol file-transfer management systems, said Sterling’s expertise in intercompany communications fits nicely with Systems Centers’ strength in intracompany communications.

“Sterling is attempting to position itself as a dominant player in the heterogeneous data communications software business, and this is a firm step in achieving that goal,” he said.

Combined, Sterling Software and Systems Center create a \$380 million company. The deal is expected to close by August.

Sterling Software has three fairly distinct businesses — electronic data interchange, systems software and a systems integra-

(continued on page 28)

“You can have a proposed standard on paper, but you don’t get any further until you have multiple, interoperable implementations.”

Phillip Gross
Chairman of the IETF
Vice president of network technologies
Advanced Network & Services, Inc.



IETF leader assesses health of Internet

Internet group gears up for next-generation IP battle while squeezing last drops from Version 4.

Q&A From its humble beginnings in 1986 when the first Internet Engineering Task Force meeting drew 15 people, the IETF has found itself confronted with increasingly complex issues.

Phillip Gross, chairman of the IETF for the last seven years and vice president of network technologies at Advanced Network & Services, Inc. in Elmsford, N.Y., spoke recently with *Network World* Senior Writer Skip MacAskill on the growing pains the IETF has undergone and the pressing issues it faces today.

With each IETF meeting, it seems talk of market and commercial concerns is growing. Is the IETF turning its back on its academic and research roots?

It’s more a sign of maturity. When you talk about an industry that’s worth about \$2 billion, that’s a huge user community you have to worry about. There are definitely market concerns here, but, at the same time, it’s people worrying about other people who use the network. I don’t think people are going to make decisions here based on market share. Decisions will be made with preserving the installed base and easing transition to new technology in mind.

As the group has grown, has it become more difficult to agree on standards?

‘Rough consensus, working code’ is the IETF’s motto. You can have a proposed standard on pa-

per, but you don’t get any further until you have multiple, interoperable implementations. You don’t get to be a full standard until it’s pretty rock solid.

Often the decisions are fairly easy because the work has been done so well. There are a nontrivial number of cases where it’s not so easy. We’re seeing a little more of that now because the group is so much bigger. It’s like the situation in picking the next version of the [Internet Protocol]. Multiple people are making proposals, but only one will win out.

I imagine that the future of IP is one of the major issues the IETF is wrestling with. Are there others?

The two biggest and most visual issues are the next-generation IP and the nomination process, which is a fundamental reorganization of the way we do business. From the beginning, the [Internet Architecture Board] has chosen the IETF chairman, who then handpicked the [Internet Engineering Steering Group]. When someone left the IAB, the remaining members would replace him by consensus. There was no voting.

In an attempt to make the organization more accountable, the user community proposed selecting members of the IAB, IESG and the IETF chairman through a nomination process. Members would be selected for two-year terms that would be staggered, with half the IAB and IESG selected one year and the other half the

(continued on page 28)

INDUSTRY BRIEFS

Fleet Call to buy AMS. Fleet Call, Inc., which will change its name to NEXTEL Communications, Inc. in August when it launches a digital wireless service in Los Angeles, announced that it has agreed to acquire a majority interest in American Mobile Systems, Inc., another Specialized Mobile Radio (SMR) provider that holds licenses in Florida.

Bean counters count on Sprint. Sprint Corp. announced that it will offer the 300,000 members of the American Institute of Certified Public Accountants (AICPA) an additional 5% off their home and business long-distance charges as part of the AICPA’s association program.

I-mux vendors team with carriers. Ascend Communications, Inc., based in Alameda, Calif., has announced that Pacific Bell will market the Ascend line of Multiband inverse multiplexers to customers of Pacific Bell’s switched digital network services.

LAN vendor team seeks new members. The Asset Group, a partnership of local-area network systems integrators, said it is seeking additional LAN vendors to service its jointly shared customer accounts nationwide and in Europe. Candidates for membership must be Novell, Inc. Platinum Resellers or Banyan Systems, Inc. Premier Network Integrators, as well as have comparable expertise with other operating environments, such as The Santa Cruz Operation, Inc.’s SCO Unix or Microsoft Corp.’s LAN Manager. ■

IETF leader assesses health of Internet

continued from page 27

next year. The IETF chairman would also serve a two-year term. That process was recently completed at the Columbus, Ohio, meeting. The newly confirmed members of the IESG are Brewster Kahle, David Crocker, Allison Mankin, Marshall Rose, Stev Knowles, Scott Bradner and Lyman Chapin.

Six people were also newly confirmed as members of the IAB, including the first female, Elise Gerrich, who was joined by Yakov Rekhter, John Romkey, Mike St. Johns, Dave Sincoskie and Jun Murai. I was reconfirmed as IETF chair.

The next version of IP has generated a lot of discussion. Is there a time frame when the new version must be in place?

We'd like to have the field whittled down by our next meeting in July. This is usually a five-year deployment cycle, with the first year or 18 months devoted to getting that rough consensus and working code. We're a year into that process now. After it's narrowed down to one proposal, which will also take another period of time, we have to get vendor penetration. That's a three-year process in itself.

Since the Internet grew so rapidly during the past few years, the need for a new version of IP became apparent. We were

running out of addresses and the routing tables were getting far too complex and unwieldy. The next IP will have to include a scheme for larger addresses as well as slow down the growth of the routing tables. The new version will be even more important in a larger sense because it will possibly redefine the way we route traffic around the network.

While there is nothing we can do about the address problem in the current version of IP, it's possible that [Classless Inter-Domain Routing] can help with the current routing table problem. CIDR is a way of re-

ducing the amount of routing table space by aggregating several different routing entries together under a single entry in a table. What it might do is squeeze the additional mileage out of IP Version 4 and give the next-generation guys some breathing room.

Any other major issues?

There's a huge evolution going on in network management right now with the next version of the [Simple Network Management Protocol]. SNMP, which is now 5 years old, has remained stable for a very

long time, but because it was built to be simple doesn't mean we can't look at ways to make it better.

The new version will add features that users are demanding, such as security, expanded protocol support and elements that will ease manager-to-manager interaction. Because net management is a big market, any changes made to SNMP will affect a huge installed base. There were some disagreements on how to do it, but rough consensus has been achieved, and it was ratified as a proposed standard two weeks ago. ■

Sterling finds fit with Systems Center

continued from page 27

tion unit. Systems Center specializes in file-transfer software, network management and other system products.

The most natural synergies between the companies are their complementary file-transfer software offerings — Sterling Software's SuperTracs and Systems Center's Network DataMover — and mainframe storage software — Sterling Software in the MVS market and Systems Center in the VM market.

Systems Center also proved attractive to Sterling Software because of its relationship with Tangram Systems Corp., a provider of electronic software distribution products, and its migration to strategic client/server platforms, such as Unix.

Michael Matthews, vice president of strategic marketing at Systems Center said, "We're bullish on systems and network management, and now we have the financial muscle to attract a critical mass of customers."

Paul Deninger, a managing director at Broadview Associates, L.P., a mergers and acquisitions firm involved in the deal, agreed, adding that Sterling Software's installed base will prove beneficial, as well. "Sterling has an enormous presence in MVS sites, and NetMaster can really benefit from that," he said.

According to several observers, Systems Center paid too much for NetMaster and was left without the funds to expand the business from there.

Systems Center's Matthews said it is too early to say whether product lines will be melded or how Systems Center will be incorporated under Sterling Software. ■



Sterling Software carves niche

continued from page 25

center here. Reportedly, Sterling Software is using products from SoftSwitch, Inc. to support the new mail capabilities, though company officials would not confirm that.

Future development plans call for support of the X.435 standard for EDI-over-X.400, a company spokeswoman said.

Sterling is also looking to rename its EDI Group to better reflect the broader scope of the electronic commerce market,

the spokeswoman said.

Victor Wheatman, program director for electronic commerce strategies at Gartner Group, Inc.'s Santa Clara, Calif., office, said the Commerce Connection offering should interest users in the electronic commerce market.

"Sterling won't be competing with the other E-mail providers directly; [Sterling is] taking a different approach," Wheatman said. "They are coming at E-mail from an EDI perspective, whereas the E-mail guys look at EDI as kind of a variant on E-mail."

Initially, Commerce Connection will be most useful for smaller users, Wheatman said. But he expects the offering to better address larger users in the near future as Sterling Software introduces products to link large users' internal E-mail nets and the Commerce Connection service.

The Commerce Connection for the PC software will cost \$240 per copy with volume discounts available. The E-mail service will cost 60 cents for the first 2,000 characters and progressively less for more characters. EDI pricing will remain the same. ■

Parts distributor axes mainframe

continued from page 25

to make the conversion, \$250,000 of which was spent purchasing new hardware. He added that Napco now spends about \$30,000 a year on systems costs.

Besides saving about \$300,000 a year in costs, the client/server platform has made the company more nimble and competitive by speeding the process of issuing and responding to request for quotes (RFQ). When Napco receives an RFQ from the U.S. government or foreign owner of U.S. military vehicles, it immediately issues RFQs to manufacturers of those parts.

Napco tracks parts made by military hardware manufacturers in its inventory database, which records such information as when the parts were last sold and to whom, and for how much. Napco salespeople use the database to figure out which manufacturers make the needed parts and to help compile an accurate and competitive response to the customer RFQ.

"The faster we can put a bid together, the more negotiating leverage we have with our suppliers," Rappaport said.

The LAN has enabled Napco to give all salespeople on-line access across the net to a commercially available CDROM containing data about U.S. military purchases.



NAPCO sells military vehicle parts.

The CDROM is used to supplement information contained in Napco's database. Previously, salespeople had to wait in line to access this CDROM, which was attached to a stand-alone, dedicated PC.

The client/server platform has also enabled Napco sales staff to download database information directly into RFQs and then, using a LAN-based fax server, transmit the RFQ response directly to the customer.

About 3G bytes of disk memory on the Tricord superserver is occupied by the Btrieve database, while about 4G bytes of disk memory is used for office automation software, such as word processors and spreadsheets. The remaining 7G bytes of disk space is used to mirror the existing data stored on the server for backup purposes, according to Ilan Sharon, a consultant on the project.

Seeing an opportunity to profit from its downsizing experience, Venturian formed a subsidiary called Venturian Software, Inc. to resell Magic software and provide consulting and development work using Magic. Most of Napco's information systems staff who helped in the transition to client/server computing are now employed at Venturian Software, which is headed by Sharon and based here. ■

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Gupta, Powersoft camps square off

continued from page 25
Brooks explained.

Brian Bussio, senior applications specialist at National Medical Enterprises in Santa Monica, Calif., said he recognizes that SQLWindows has a steeper learning curve than PowerBuilder but prefers it that way.

"The difficulty of learning SQLWindows goes a long way toward teaching you how Windows actually works, how it has

evolved and what it does internally," he said. "Developers that build applications without a solid understanding of the underlying operating environment are inviting disaster."

PowerBuilder proponents say the real advantage of PowerBuilder is that it hides the complexity of building client/server applications.

However, that is the problem, according to Bussio. "Eventually, your PowerBuilder program is going to do something that screws up an operating system or Windows capability that you don't know much

about," he said. "That's dangerous."

Good and bad support

When PowerBuilder developers encounter problems, however, they have been pleasantly surprised by the high quality of Powersoft's support. Brooks said Powersoft technicians would routinely spend an hour or two on the telephone walking him through his code. He has even faxed problem code to Powersoft, which was able to recommend a fix within a day.

"Powersoft bends over backward to support you as a customer," Cooley said.

In contrast, developers have slammed Gupta's support. Cooley said it often takes days to reach an available technician via phone, while Brooks said it often takes Gupta three to four days to respond to a written request for support on a particular problem.

Analysts and users said Gupta's SQLWindows 4.0, which shipped earlier this month, surpasses PowerBuilder in its ability to let teams of programmers work cooperatively on a large application. SQLWindows 4.0 supports a dictionary-driven repository for storing application component templates and development information.

While PowerBuilder can be integrated with tools from several computer-aided software engineering vendors, it does not have a repository of its own.

"[Application] designs can't be automatically replicated within PowerBuilder because it doesn't have a repository," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

Alternatives

While many developers are ardent fans of either PowerBuilder or SQLWindows,

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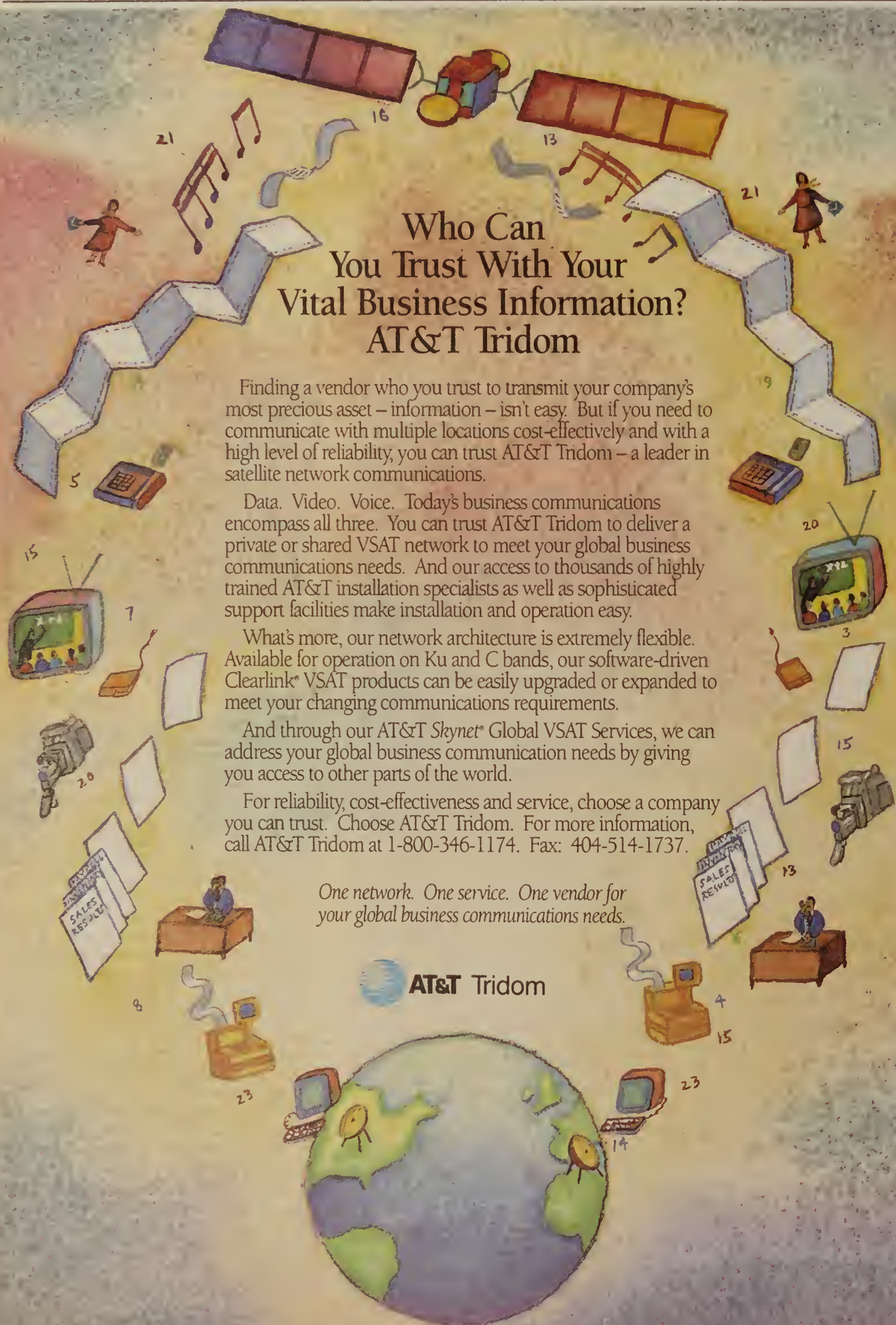
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Some questioned whether the tools could adequately support high-volume enterprise applications that require tight database integration and high performance.



some questioned whether the tools — especially PowerBuilder — could adequately support high-volume enterprise applications that require tight database integration and high performance.

One developer who requested anonymity said he knows many companies that have dumped or that soon will dump PowerBuilder in favor of other tools such as Microsoft's Visual Basic or Visual C++.

"[PowerBuilder] doesn't seem to hold up when you start beating on it," said the developer, who has served as a beta test site for PowerBuilder 1.0 and 2.0 releases.

The developer said it takes at least a 386 33-MHz personal computer with 8M bytes of memory to run a decent-size application with PowerBuilder and obtain adequate performance. Moreover, PowerBuilder chews up network bandwidth because it generates SQL statements on the client and ships them across the network instead of using stored procedures on the server. "Since most users have low-end 386s on their desktops, requiring high-end 386 or 486 machines just isn't going to fly," the person said.

In contrast, applications developed using Visual Basic are two to three times faster than PowerBuilder applications, require less memory on the client and cost a couple of hundred dollars compared to a couple of thousand dollars, the developer added. □

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

“Our current tax code encourages and instigates class warfare. Today, the top 5% of all wage earners pay 44% of all income tax. And if Mr. Clinton has his way, this will increase further because he has campaigned on the basis of ‘the politics of envy.’”

Gil Amelio
Chief executive officer
National Semiconductor Corp.
Santa Clara, Calif.

Manager Minutes

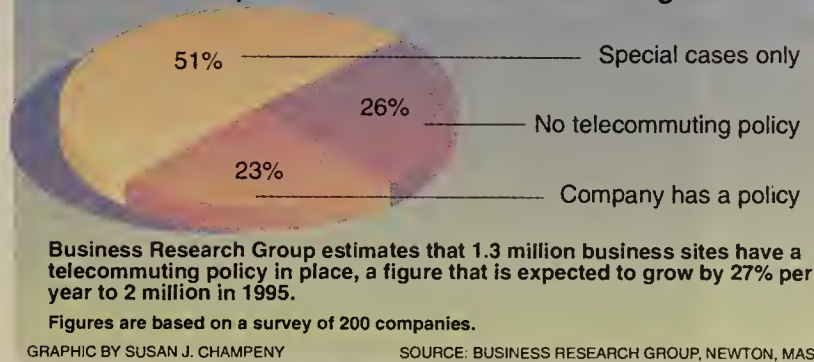
Tele-Communications Association, Inc. (TCA) has announced that Robert Allen, chairman and chief executive officer of AT&T, and Robert Metcalf, founder of 3Com Corp. and now publisher of *InfoWorld*, will be the keynote speakers at TCA's 31st annual conference in San Diego from Sept. 20-24.

Allen, who first joined AT&T in 1978, will open the show with a talk titled, “Telecommunications: Merging Technologies.” Metcalf, one of the original inventors of Ethernet, will give the closing session address on local-area networks. The conference and trade show are open to the public. For more information, call (818) 859-2657.

In a separate action, TCA recently approved the formation of its 11th chapter, the Utah Chapter. Previously known as the Utah Telecommunications Managers Association, the group held its first meeting two weeks ago, electing Geoff Williams as its president. ☐

Looking homeward

Corporate stances on telecommuting



Innovative software boosts productivity of meetings

GroupForum tool sparks interactive dialogue.

By Joanne Cummings
Senior Writer

OXFORD, Miss. — A professor at the University of Mississippi here has developed meeting software designed to improve productivity and cut down on the time needed for large meetings.

The software, called GroupForum, enables meeting participants to anonymously express their opinions and offer ideas about problems, projects and goals, without fear of criticism from the boss or fellow employees.

“Some people who are shy often don’t contribute to a meeting, even though they may have viable ideas and solutions,” said Milam Aiken, an associate professor for MIS at the school and the developer of the software. “And in traditional meetings, with one person talking at a time, there may not be enough time to hear everyone’s ideas. GroupForum changes that.”

Enhancing the experience

The software runs on any industry-standard local-area network, such as Novell, Inc.’s NetWare or Banyan Systems, Inc.’s VINES.

For optimum use of the product, the LAN should be set up in a conference room, Aiken said, but the software can support distributed meetings, with participants dialing in from offices off-site.

GroupForum consists of a group leader controller module and several participant modules, all of which run on the server. Aiken recommends that GroupForum meetings include at least eight users, noting that the software’s usefulness increases with

the number of meeting participants.

“Traditional meetings become less productive as the number of people increase,” Aiken said. “But with GroupForum, productivity is enhanced because several people can contribute at once.”

Tailoring the software

The software has several modules designed for different meeting-related tasks.

The basic brainstorming version enables the group leader to build an agenda and then lets each participant type ideas and comments for each agenda item at will. An advantage is that each comment can then be viewed by the other participants in real time.

Other modules are available for voting, ranking and rating items, and automated questionnaires. In addition, Aiken is working on a version that will provide automatic language translation, enabling users to run multilingual meetings without having to hire a translator.

Currently, Aiken has developed an English-German and an English-Spanish version. However, he expects to have a Russian and Japanese version soon.

Aiken has developed his own corporation, called Oxford Intelligent Software, Inc., to sell GroupForum.

The GroupForum software is available now and ranges in price from \$3,995 for a 10-user version to \$8,995 for a 50-user version. A package supporting translation from English to one other language costs \$12,995.

For more information, contact Aiken at (601) 236-7097. ☐

THE INTERNET

BY ED KROL

Internet’s Web is doing just fine, thank you

If we were playing \$20,000 Pyramid and I gave clues such as Tucker Torpedo, L-1011, 3-D movies and beta VCR, could you guess the category?

No? Well, the category is “better products that never made it big.” These products were done in by competitors that offered less functionality due to a combination of timing, consumer acceptance and maintenance ease.

Some people on the Internet would mistakenly place the World Wide Web (WWW) in this class, but it is alive and growing. WWW, like Gopher, is an integrated delivery tool developed at Centre European for Nuclear

Research, a high-energy physics laboratory. It presents the Internet’s resources in an organized manner, allowing you to choose what you want to access and accessing it from within the WWW’s software.

What makes it unique is that the method of presentation and selection is hypertext, which is a method of placing within the text invisible pointers to other information.

If this other information is requested, the presenting software can follow the pointer and find it.

That’s a mouthful, so maybe an example will clear it up. If this article were in hypertext, (continued on page 34)



CeBIT demos show PDAs getting closer to reality

By Ron Condon
IDG News Service

HANNOVER, Germany — Network managers may soon have another computing option for their users as new pen-based computers, also known as personal communicators or personal digital assistants (PDA), get closer to becoming a reality.

The new hand-held products were the talk of the recent Hannover Fair CeBIT exhibition here, but actual working commercial products were difficult to find.

Apple Computer, Inc. and Tandy Corp. were among the vendors that used the exhibition to demonstrate beta versions of their product, the Newton PDA. The companies also announced a series of third-party licenses for the technology.

Tandy showed its Zoomer personal communicator and promised a fall release for the product. Talk of forthcoming PDAs from industry giants such as Compaq Computer Corp., IBM and Sie-

mens Nixdorf InformationsSysteme AG also created a buzz on the show floor. A Microsoft Corp. official discussed an upcoming version of Windows, called WinPad, designed for PDAs and other hand-held computers.

Among the other PDA prototypes displayed here was an Intel Corp.-compatible combination pen-based personal computer and cellular telephone from a California start-up, as well as a family of machines designed by a small U.K. company to show off its patented pen interface for personal organizer software.

Yet the PDA stir at CeBIT was long on excitement and short on substance. Apple’s demonstration was marred by an embarrassing failure of a third-party product; several of the PDA prototypes on display were in glass cases that precluded live demonstrations. Other products planned to be introduced at the show or released this spring were delayed by a (continued on page 34)

A disk problem causes you incredible discomfort. A lapse in memory takes its toll on your entire system. It wasn't anyone's fault. But now it's yours. Because if it affects the LAN, you're the one who has to deal with it.

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With the Maximum Availability and Support System/2 (MASS/2) option, the Server 195 provides comprehensive local and remote server monitoring, control, tuning

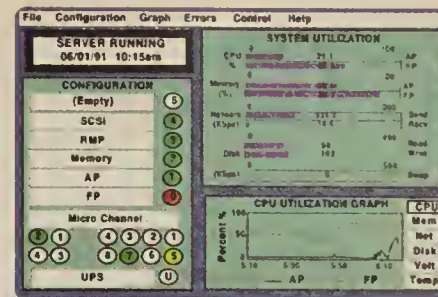


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It even tolerates



and recovery capabilities. MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



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Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
Available Slots	8 Micro Channel®	12 Micro Channel	12 Micro Channel
MASS/2	optional	standard	standard

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your worst faults.

CeBIT demos show PDAs getting closer

continued from page 31

But despite the false starts, PC makers see a vast potential market for hand-held, pen-based machines and are rushing to catch what could be the computer industry's next big wave before it crests.

Apple announced several license agreements at CeBIT, including deals with Kyushu Matsushita Electric, Motorola, Inc. and Siemens Nixdorf, which all plan to use

Apple's Newton architecture in their respective products. Apple also announced that Cirrus Logic, Inc., LSI Logic Corp. and Sharp Corp. will produce Newton components for sale to other manufacturers.

While Apple's push to make its Newton technology an industry standard has gained momentum, Siemens Nixdorf endorsed a rival technology based on the AT&T Hobbit chipset technology from EO Corp. As Apple's Newton- and Hobbit-based products from AT&T-EO took the lead at CeBIT, Intel and Microsoft were set to make it at least a three-horse race.

Microsoft is working on a version of Windows that will run on a range of Intel-compatible hand-held devices, according to Paul Maritz, senior vice president of Microsoft's systems division in Redmond, Wash. The software, tentatively called WinPad, is a scaled-down version of Windows based on Microsoft's core technology called Modular Windows, he said.

"Our vision is a whole family of non-PC products — hand-held is one example — running Windows-related software," Maritz said during an interview here last week.

Each of these non-PC products will re-

quire a different subset of Windows. For example, Microsoft will exclude DOS compatibility from WinPad since hand-held devices will run a narrow set of applications.

Microsoft will market some of its own applications for PDAs "to make sure there is critical mass," Maritz said. The firm will also encourage third-party vendors to write software for WinPad. Microsoft is still working on WinPad, he added, and will announce more detailed information about the software, based on Microsoft's Modular Windows project, in the next three to six months.

Microsoft's approach of providing a common operating system core from hand-held devices to net servers differs dramatically from Apple's, Maritz said. While Apple offers different operating systems for hand-held, desktop and enterprise systems — Newton, System 7.0 and A/UX, respectively — Microsoft wants to scale Windows to run in all three environments. *(continued on page 49)*

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Circle Reader Service #5

Internet's Web doing just fine, thank you

continued from page 31

the previous paragraph wouldn't have to be here. The definition of hypertext would be in another column (or file) somewhere. If you were puzzled by the word "hypertext," you could point to the word and request more information, and the definition would pop up. If you already knew what hypertext was, you wouldn't ask for more information and would simply read on.

The problem with hypertext is creating it. Hypertext must be prepared using something called a markup language, which allows a variety of hidden directives to be included in the text. These directives can describe the structure of the text, such as pointers and emphasis.

Like other Internet tools we have discussed, using the WWW requires you to have access to a software client. These clients, called browsers, are available for installation on many popular platforms. A good place to look for software is via anonymous FTP from the mother site of the Web, info.cern.ch.

If you want to browse before you shop for a browser, try telnetting to eies2.njit.edu (use login www) or info.cern.ch (no login required). This browser will not be as slick as an X version, but its character interface — where you type the numbers of the items you want opened — is obvious and serviceable to the novice user.

Some believe the Web isn't going anywhere because its slow, steady growth has been eclipsed by the explosive growth of Gopher, which has experienced such growth because its simple structure makes it easy to establish servers and resources.

But that simple structure limits the high end of what Gopher can provide in the long run. What we may have is probably not the Internet's version of Betamax, but rather a revisiting of the classic race between the tortoise and the hare (or Gopher). ■

Krol is author of The Whole Internet (O'Reilly & Associates, Sebastopol, Calif., 1992) and assistant director for LAN deployment at the University of Illinois at Urbana-Champaign. He can be reached at e-krol@uiuc.edu.

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OPINIONS

800-NUMBER PORTABILITY

BY DANIEL MILLER

Prepare to reap benefits of carrier competition

On May 1, users will have 800 portability — the ability to switch long-distance carriers without giving up their 800 numbers. Competition between the major carriers is becoming fierce as they seek to retain subscribers and attract new ones by enhancing their 800 services. Now is the time for users to take stock of their needs and position themselves to take advantage of the latest developments.

Research done by Strategic TeleMedia, a New York-based consultancy, shows that awareness of portability is almost universal among 800 subscribers. However, awareness doesn't guarantee understanding of the issues involved.

In the past, 800 numbers were treated as carriers' property. After May 1, users can "own" their 800 numbers. In addition, users will gain access to Advanced Intelligent Network features

that can enable them to tell the network how to treat individual 800 calls — for example, splitting traffic among sites and carriers. Implementation of a new nationwide 800 database management system will make this possible.

Strategic TeleMedia's survey shows that nearly half of all 800 customers are considering switching their long-distance carrier. That means \$3.5 billion

of the estimated more than \$7 billion in 800-service revenues is up for grabs.

AT&T's last monopolistic bastion was 800 service. For 20 years — from 1967 to 1987 — AT&T was the sole source of 800 numbers. During the past five years, MCI Communications Corp., Sprint Corp. and other carriers, including local exchange carriers, have joined in a battle waged at the Federal Communications Commission to define terms under which they will compete on equal footing.

Press coverage has tended to focus on the technical and political minutiae surrounding the cutover to the new 800 database. Meanwhile, the true importance of 800 portability is being treated like noise on the line. Put simply, heightened competition is pressuring carriers to reintroduce 800 services with a much broader array of services, features and functions.

For instance, the FCC has ordered the local exchange carriers to pursue aggressive timetables for installing Signaling System 7 (SS7) to meet stringent call setup requirements. SS7 is a major technical foundation for virtually all enhanced telecommunications services, both local and long distance.

So while local-exchange carriers are dragged kicking and screaming into the world of SS7, their protests are reminiscent of Brer Rabbit urging the fox not to throw him into the briar patch. Their real question is whether the fees they can charge will cover the huge investment in equipment and resources required to keep to their deployment schedules.

Today AT&T, MCI and Sprint are engaged in an intense war of words. When May 1 arrives, they will graduate to a feature-for-feature slugfest. Users have much to gain if they look beyond the hype and study the hard issues. ■

Miller is president of OPUS Research, Inc., a management consulting firm in San Francisco. He can be reached at (800) 428-6787 or via MCI Mail at 337-9503.



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EDITORIAL

Commitment, not promotion, is what ISDN really needs

Back in November, the Transcontinental ISDN Project (TRIP) '92 grabbed headlines and buoyed the hopes of ISDN proponents who saw the event as a way to jump-start the stalled technology.

But did it make a difference?

In all outward appearances, the answer is no. There's been no ground swell of user support for Integrated Services Digital Network service, which is still viewed as the panacea that never materialized. Even worse, users are still wrestling with ISDN issues that should have been resolved by carriers long ago.

Local telephone companies pitch ISDN under a confusing array of names — SmartTrunk? Primary Service? — that dilute ISDN's image as a standard, na-

tional service. Pricing varies widely from region to region, as does availability. ISDN is still tied unnecessarily to Centrex in some cases.

Incredibly, users — particularly end users or smaller firms — get the runaround trying to order ISDN. It's not unusual to hear about prospective customers being bounced from telco rep to telco rep trying to find an ISDN-knowledgeable person who can help them sign on.

Now carriers will cite statistics on the ISDN-readiness of their nets. But that doesn't translate into market acceptance, which is the issue here.

In reality, TRIP '92 doesn't seem to have changed even the carriers' perspective on ISDN — which is borne from all the talk

about a national network infrastructure. As the Electronic Frontier Foundation asserts, ISDN is a proven technology that could deliver most of the advanced services envisioned as part of a national data network. Yet carriers appear wed to the idea of bringing fiber to the home at huge expense.

How can users get excited about ISDN if the carriers aren't? How can users commit to new data services such as Switched Multimegabit Data Service given their experiences with ISDN?

Rather than promotional events such as TRIP '92, the carriers should focus on a national marketing strategy that overcomes the problems users face with ISDN and pushes the technology for all its worth. ■

OPINIONS

THE BLUE VIEW

BY ANURA GURUGE

Gerstner should think of the net impact of reshuffling IBM



The appointment of Louis Gerstner Jr. to head up IBM could prove to be a double-edged sword. On one hand, as an outsider, Gerstner may bring a fresh outlook to IBM. On the other, he may be tempted to seek short-term glory by implementing an asset-stripping regime that pays little heed to the delicate internal infrastructure that makes IBM what it is today.

IBM is the one company in the world that can provide an enterprise with a "soup-to-nuts" integrated solution — from mainframes to Reduced Instruction Set Computing-based workstations, from terminals to multiprotocol bridge/routers, from industry-standard operating systems to Unix and from consulting services to a public Systems Network Architecture network.

Given that he will be under pressure to show results, Gerstner may think that he doesn't have time to fully comprehend what makes IBM tick.

This may cause him to implement ideas that have worked for him in the past, such as asset stripping. If carried out, asset stripping will have a marked impact on net managers and users.

While few user networks, including SNA nets, are sourced exclusively from IBM, Big Blue often provides key vertical integration technology or products. Users can buy products and have them supported by one integrated organization — IBM.

Asset stripping could end this one-stop shopping and support, the very reason many users were attracted to IBM in the first place.

The hasty divestment of any IBM asset could have a detri-

mental impact on what is left.

Particularly crucial in any asset distribution scenario is the positioning of Ellen Hancock's Networking Systems unit — the glue that would supposedly continue to bind a "new IBM" consisting of a federation of autonomous business units. It would be foolhardy for Gerstner to disrupt the status quo without carefully considering the implications to Networking Systems.

If Gerstner decides to pursue asset stripping, one of two scenarios involving Networking Systems is likely to result.

The first would involve selling Networking Systems. Although the unit appears to be successful, its revenues per employee are anemic compared to other IBM business units such as Enterprise Systems and Application Business Systems. This may tempt Gerstner to cut Networking Systems loose.

That could be a mistake. The other business units need the enterprise integration solutions that Networking Systems is now delivering, such as the Networking Blueprint-based Multiprotocol Transport Feature that permits mix-and-match net integration; the SystemView-based NetView/6000; the cross-platform CICS transaction management system; and the multiprotocol 6611 bridge/router.

In the second scenario, Networking Systems would remain part of IBM, but other business units such as Personal Systems and Application Business Systems would be let go.

Would Networking Systems then get lumped in with Enterprise Systems? If so, Networking Systems might be forced to become less aggressive on its multivendor, multiprotocol initiatives and concentrate on mainframe-centric networking.

There is even a more remote asset-stripping scenario in

which each business unit would be floated independently, with current IBM shareholders getting first pick at which units they want their shares converted to.

In such a scenario, how would Networking Systems fare? While technocrats can appreciate the asset that Networking Systems is, would shareholders, only interested in their return on investment, feel the same way? These are difficult questions with no easy answers.

This is why it is troubling that IBM's board chose an outsider, rather than an insider who understands the intricate IBM ecosystem. Their rationale was that IBM's culture needed to be changed. And that's fine, but wouldn't it be valuable for the new leader to have an appreciation of the culture before setting out to change it?

In hindsight, we now regret the colonization regimes of old that set out to eradicate existing cultures, irrespective of whether they were good or bad.

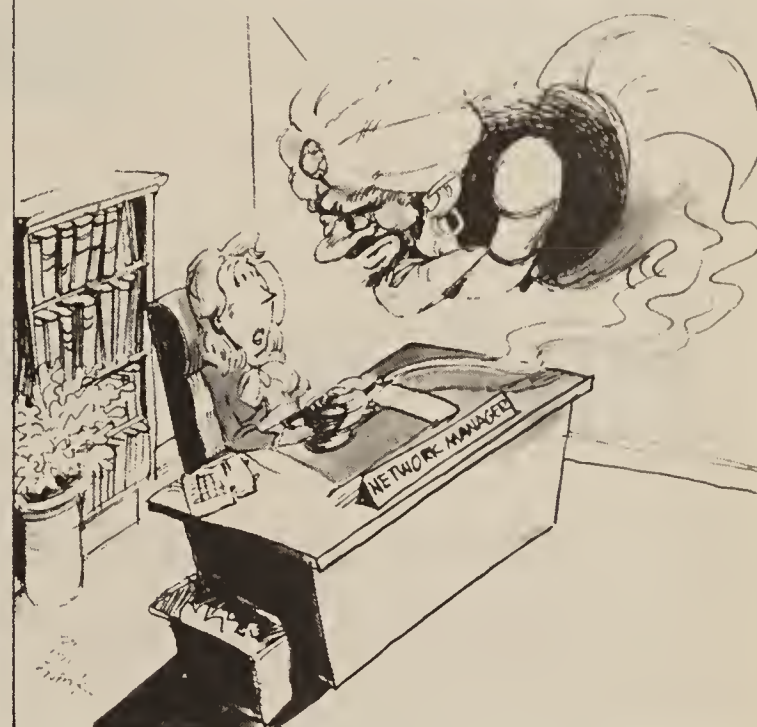
Gerstner could be in danger of becoming a well-intentioned imperialist, setting foot on an unknown land with his mind already made up that the existing culture has to be changed. He would be wise to learn from what happened to another outsider entrusted with the task of trying to turn around a troubled computer company: Richard Miller of Wang Laboratories, Inc. One joke currently circulating sums up the possible danger: "What is the difference between IBM and Wang? A few months."

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He writes extensively, presents seminars worldwide and can be reached at (603) 878-1303 or via Internet/MCI Mail at aguruge@mcimail.com.

TELETOONS

BY FRANK AND TROISE

That's right... three wishes... but if you ask me to do anything on strategic planning, I'm outta here!



LETTERS

Feeling left out

We were puzzled to see that David Axner's recent article on distributed management (NW, March 15, p.11) overlooked our premier distributed management product.

IBM's AIX SystemView NetView/6000 is a powerful distributed systems and network management platform with rich function and burgeoning vendor support.

Indeed, an article in your Feb. 8 issue paraphrases analysts saying the enhancements we announced for NetView/6000 earlier this year "establish IBM as a multivendor management leader." With commendations like these, we believe your readers deserve full consideration of NetView/6000.

Sanjiv Ahuja
Product manager, AIX
network management products
IBM
Research Triangle Park, N.C.

David Axner's response: The omission of NetView/6000 was not an oversight. In the interest of fairness, entries in the chart accompanying the article were limited to one product per vendor. LAN NetView was selected because it was the most recent product introduced by IBM that supported Simple Network Management Protocol net management.

Consider our plight

In his column, "Standards dream will die unless process is retooled" (NW, March 22, p.31), John Rymer focuses on standards for distributed computing. But his comments also apply to networking.

The same issue covered the process of standardizing high-speed Ethernet, a nonstandard Fiber Distributed Data Interface using noncompliant physical-layer media-dependent specs, (continued on page 49)

ATTENTION VENDORS OF LAN MANAGEMENT WARES: *Network World* invites you to participate in a product survey for a Buyer's Guide to be published July 5. This Buyer's Guide will examine the critical selection criteria and current market trends that influence the purchase of LAN management products.

To obtain a survey form, call Kyle Nitzsche, associate features editor, at (508) 820-7427. Requests for survey forms must be received by Monday, April 26.

Want to respond to an article or opinion in Network World? Mail typed letters to Editor, Network World, 161 Worcester Road, Framingham, Mass. 01701, or fax them to (508) 820-3467. Transmit your response via MCI Mail at 390-4868 or to our Bulletin Board System. (See page 2 for BBS instructions.) Letters may be edited for space and clarity.



DATA COMM

BUYER'S GUIDE

HIGH-SPEED MODEMS

Fast modems just got *faster*

Move aside those 9.6K bit/sec modems; higher speed devices packing more features are ready to take over.

Nowhere in all of networking is buying such a simple product so confusing.

The high-speed modem market consists of dozens of models, each supporting a matrix of standard and optional features that are enough to make any net manager's head spin.

Buying high-speed modems today for use across an enterprise net is not as simple as picking a desired transmission speed and ordering the least expensive modem available.

The process has changed considerably in the past year. While 9.6K bit/sec modems were considered high speed not long ago, today's net managers are better off looking at devices that support the CCITT V.32bis standard for 14.4K bit/sec transmission.

For a difference of just a few hundred dollars over V.32, network managers can even purchase modems with such high-end features as support for the upcoming V.fast transmission standard at 28.8K bit/sec. With compression, V.fast and V.32bis throughput can reach as high as 115.2K bit/sec — competitive with many switched digital service options.

When comparing modems, users need to consider numerous attributes such as standards support, error control and, of course, final price. In addition, there's a broad range of high-end modem capabilities — including built-in compression, network management, security and facsimile support — available in V.32bis modems often at little or

no extra cost over less functional, slower speed devices.

Gamut of products

The spectrum between high-end and low-end modems is loaded with model options; this Buyer's Guide represents 144 modems from 35 vendors. And every vendor is staking out its own market segment.

At the high end of the market, the latest entrants support the emerging 28.8K bit/sec V.fast technology. There are many feature-loaded modems that support dial-up as well as two- and four-wire leased-line transmission and come packed with local and remote network management capabilities.

Many vendors can even offer software-downloadable upgrades and cellular transmission support. AT&T Paradyne's Comsphere 3810 offers all of these features for only \$1,195.

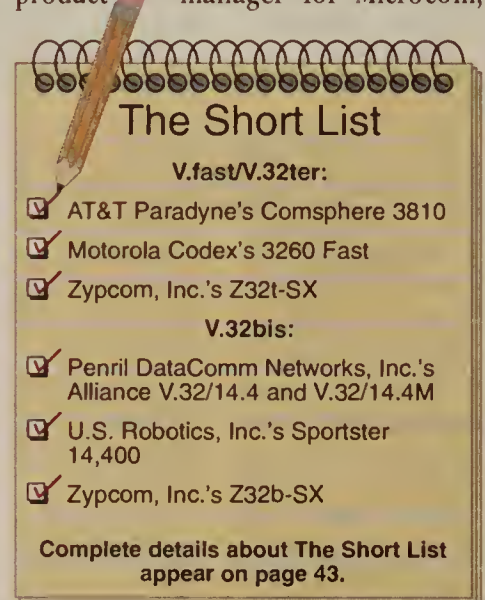
Some high-end modems cost as much as \$3,000, while some such as Multi-Tech Systems, Inc.'s MT1432MR, consist of multiple modems on one rack-mount card or offer special combinations of features on a single high-end modem.

For buyers seeking a basic transmission capability with no bells and whistles, there is a broad range of capability at the low end of the market.

Simple 14.4K bit/sec dial-up modems are available for as little as \$229.99. U.S. Robotics, Inc.'s Sportster 14,400 offers 14.4K

bit/sec transmission at that price. With such low pricing, it doesn't seem practical to buy a 9.6K bit/sec or slower modem.

"The same trends are driving the market as always: smaller, faster and cheaper," says Ed Kopec, modem product manager for Microcom,



The Short List

V.fast/V.32ter:

- ☒ AT&T Paradyne's Comsphere 3810
- ☒ Motorola Codex's 3260 Fast
- ☒ Zypcom, Inc.'s Z32t-SX

V.32bis:

- ☒ Penril DataComm Networks, Inc.'s Alliance V.32/14.4 and V.32/14.4M
- ☒ U.S. Robotics, Inc.'s Sportster 14,400
- ☒ Zypcom, Inc.'s Z32b-SX

Complete details about The Short List appear on page 43.

Inc. in Norwood, Mass. "For new purchases, V.32 has become the modem technology of choice." But Kopec estimates that by 1995, 40% of the modem market will have migrated to V.32bis or V.fast.

The move toward portability of computing resources is forcing vendors to shrink modem sizes.

Small pocket-sized modems designed specifically

for portable computing are growing in popularity, although only a few providers currently offer such products. U.S. Robotics' WorldPort series of modems is only about 1 by 3 by 4 inches and 5.5 ounces, yet it offers V.32bis and fax capabilities. In the Buyer's Guide chart, 43 of the 144 modems listed offer support for cellular transmission.

Megahertz Corp.'s PCMCIA Notebook Data/Fax Modem is designed around the Personal Computer Memory Card International Association (PCMCIA) standard for adding functionality to portable computers by inserting credit card-like computing cards into the devices.

The latest version of the standard, PCMCIA 2.0, supports expanded memory and adds fax and modem capabilities. It also creates options for cellular and local-area network connectivity. AT&T Paradyne markets such a PCMCIA modem card, its Keep In Touch 14.4 Data/Fax card.

More data, faster

Cellular support may be attractive to some, but throughput remains the top issue for most users. A significant problem facing users is increasing file sizes. The movement toward distributed computing is putting pressure on users to access more data faster.

"The ability to append sound to spreadsheets and send video images with E-mail is changing traditional file sizes by orders of magnitude," Kopec says.

By DANIEL BRIERE

The answer for end users is to send more data faster, and the launching point for doing so is the V.32bis standard since it pushes speeds to 14.4K bit/sec. But AT&T Paradyne has developed a proprietary protocol, dubbed V.32ter, that pushes transmission speeds to 19.2K bit/sec. And the emerging V.fast protocol will offer speeds up to 28.8K bit/sec.

It is important to recognize that the 28.8K bit/sec transmission speed offered by V.fast is the transmission rate. Vendors will claim throughput speeds of up to four times that amount, which is possible through advanced data compression techniques.

In practice, such compression is dictated by the actual content of the file, as well as the transmission environment and quality of the line, making the resulting throughput vary from file to file and line to line.

The CCITT V.fast standard is expected to firm up in 1993, with final approval probably coming in 1994. As V.fast nears draft standard status, expect modem makers to rush their own implementations of it to market.

At the ComNet '93 conference in Washington, D.C. this past February, more than 60 modem makers, representing 75% of the worldwide modem production, announced formal support for V.fast.

To date, Motorola Codex is the only vendor to ship a proprietary V.fast modem. Other vendors — such as AT&T Paradyne, Octocom Systems, Inc. and Zypcom, Inc. — have announced intentions to offer early V.fast implementations.

"We're not offering a V.32ter or a preliminary V.fast product because with the V.fast standard so close to approval, we'd just end up with a small customer base who want an upgrade to the full V.fast standard," says Alan Bach, manager of modem products at Hayes Microcomputer Products, Inc.

Several vendors — such as AT&T Paradyne and Zypcom — have already brought V.32ter modems to market. V.32ter is viewed by many as an interim high-speed modem technology supported by a limited set of vendors. V.32 has come under attack by some vendors that don't want it to affect the viability

of V.fast.

"The V.fast people are throwing rocks at V.32ter, even though it really was not designed to compete with V.fast," says Tom Heimerman, director of sales and marketing at Multi-Tech Systems in Mounds View, Minn.

AT&T Paradyne created V.32ter, he says, because users expressed a need for higher throughput. V.32ter is here today, while V.fast is still in development. It's important to note that while V.fast is being developed by the CCITT, V.32ter is not an officially sanctioned standard, but rather was developed solely by AT&T.

Ultimately, it appears that V.fast will dominate the high end of the market since it is 50% faster than V.32ter and is widely supported by vendors.

"V.fast fully utilizes channel bandwidth and allows for speeds twice the rate of V.32bis," says Microcom's Kopec. "V.32ter only uses a portion of the bandwidth and is, therefore, less efficient."

On the other hand, because V.fast is not a complete standard, products are scarce and still rather pricey — though costs are expected to plummet quickly.

V.32ter and V.fast are two of the newer transmission standards, but there are many others that users might consider (see Figure 1, page 42).

Standards compliance

Buyers should also be wary of vendor claims to support standards. Some vendors claim to have modems that are "compatible" with a standard, meaning the devices may or may not fully interoperate with a modem that is truly compliant with the standard.

Users should buy standards-compliant modems only. Make sure vendors are clear on their level of standards support. They are required to use either the word "compliant" or "compatible" regarding support for CCITT protocols.

Even though modem manufacturers often support the same standards, there are subtle differences in the way they implement these standards and in how fast they perform the necessary functions.

"Many modems on the market support the standards but do not have the processing power and compression al-

gorithm required to attain the maximum throughput possible," explains Dan Wagner, product manager at Intel Corp.'s PC Enhancements Division in Portland, Ore. However, in order to determine these subtleties, net managers often must resort to head-to-head product testing.

data compression protocol will provide users with about a 200% increase in throughput, while the CCITT V.42bis protocol tops that with a 400% increase.

One problem with compression is oversetting expectations. All vendors are guilty of promising theoretical com-

Ultimately, it appears that V.fast will dominate the high end of the market.



Wagner notes that such factors as how fast a modem transmission rate automatically falls backward when it encounters line problems and then forward again when the line clears affect overall throughput.

One problem, Wagner says, is that many of the faster modems are being plugged into older PCs and are still expected to hit theoretical throughput levels. "The weakest link is between a modem and the PC itself," he says.

The standard RS-232 serial interface for connecting modems in most PCs cannot move data quick enough to keep up with today's fastest modems. Companies such as Hayes and Intel are developing unique solutions to this problem that don't sacrifice performance.

Intel's Smart UART Buffering feature on its modems is one example. By using a built-in coprocessor in its modems, Intel off-loads some processing from the modem's CPU and ensures that data can move at the highest possible rate between the modem and an attached computer.

Squeezing data

There are two methods to maximize modem throughput, and net managers need to consider both when making large-scale purchases.

First, buyers can look for devices that support standards such as V.fast, V.32ter or proprietary transmission protocols. The other method is to compress a file before transmitting it and then decompress it at the other end.

There are two data compression standards for high-speed modems. The Microcom Network Protocol (MNP) 5

pression gains of 4-to-1 when gains of 2.5-to-1 or 3-to-1 are more reasonable.

That is, if you have a 28.8K bit/sec modem, the likely throughput using V.42/V.42bis will be in the neighborhood of 70K to 85K bit/sec, not 115.2K bit/sec. Noisy lines, inefficiencies in communications software and the content of the file itself will limit compression effectiveness and, therefore, transmission throughput.

Users should note that compression isn't suited for all types of data transmission. Text files respond best to compression, while audio files probably respond the worst.

Files already compressed through a compression program, such as Aladdin Systems, Inc.'s Stuffit, will also be largely unaffected by modem compression. The V.42bis protocol is designed to detect previously compressed files and not waste time unnecessarily compressing and decompressing them.

Proprietary modes of compression are sometimes preferred by users.

"We use Telebit [Corp.'s Packetized Ensemble Protocol] mode," says Rich Greene, a systems analyst with Almont Analytical, a Farmington, Conn., financial data services provider and a subsidiary of The Thomson Corp. "It seems to be dynamic enough across our customer base to handle lots of different line qualities," he says. "We find it's up to three times faster than V.42."

Telebit's PEP modulation divides the telephone lines into 511 carrier frequencies and selects the best frequency to transmit data. The maximum trans-

(continued on page 42)

MAY						
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Look in the May 10 issue of *Network World* for a throughput test on high-speed modems. TeleChoice, Inc. will examine the V.fast and V.32ter modems currently shipping. The tests will be based on TSB-37A and TSB-38 modem specifications devised by EIA/TIA.

(continued from page 41)
mission speed under PEP mode is 23K bit/sec.

Octocom and Western DataCom Co. have proprietary compression schemes, too.

These various protocols can sometimes be combined for higher throughput. The

mance and maintains connections over poor land lines and cellular networks.

At least four of the vendors surveyed support MNP 10 on their products: Applied Engineering, General DataComm, Inc., Microcom and Zypcom. This number is expected to grow since both AT&T Microelectronics, Inc. and Rockwell International

attempt to maintain the connection. However, not all modems will fall forward by stepping up the transmission rate when line conditions improve.

This feature is critical for network managers looking to minimize dial-up costs. Without this fall-forward feature, if a modem backs down from 14.4K bit/sec to 7.2K bit/sec and doesn't reset back to the original transmission rate when conditions improve, file transmission time will double.

Of the 144 modems in the Buyer's Guide, 100 will fall forward in this manner. Some exceptions include certain modems from Focus Enhancements, Inc. and Hayes.

With regards to fallback speeds, many modems comply with procedures specified in some CCITT standards, such as the V.32 standard. A typical fallback progression might be 14.4K, 12K, 9.6K, 7.2K, 4.8K, 2,400, 1,200, 300 bit/sec.

Some vendors, however, have established intermediate proprietary speeds such as 7.2K bit/sec between 9.6K and 4.8K bit/sec for more efficient operations. Racal-Datacom, Inc.'s ALM 3239 modem has a proprietary and standard fallback speed of 1,200 bit/sec, for instance.

Upgradability

Just as fall-forward features appeal to cost-conscious net managers, so will modems designed to extend the product's life through software upgrades.

Some modems come with internal firmware chips that support various software capabilities. Users can reprogram these modems by downloading new software to the firmware chips within the modem.

This is particularly important for companies that want to take advantage of proprietary V.fast modems prior to the formalization of the standard.

When the standard is issued, vendors can download new software directly to the

modems. Likewise, as vendors roll out new network management standards, modems can be upgraded to support them.

Dan Bucklin, a financial consultant with a major national brokerage firm in Gig Harbor, Wash., was ecstatic with ZyXEL's upgradable programmable read-only memory-based modems.

"In an industry where obsolescence is something to expect, it's nice to know that if you're putting some big dollars into equipment, it'll be around for a while," he says.

Vendors such as Forval America, Inc., General DataComm and Racal-Datacom offer firmware-based modems. Other manufacturers require net managers to swap out existing units with newer upgrades or send the customer replacement chips.

Modem management

Almost all high-end modems come with

Almost all high-end modems come with some form of net management.



some form of network management, although most vendors currently offer proprietary schemes. Vendors generally offer local and remote monitoring and configuration of modems.

Some of these systems come with a graphical display where modem racks or banks are shown complete with flashing LEDs. AT&T Paradyne and Motorola Codex are strong in the market for these types of

Modem speed standards					
Figure 1					
Standard	Modem type	Mode	Speed (bit/sec)	Fall-back speed (bit/sec)	Comment
V.21 (1)	Dial-up	Duplex	300		Used by Group 3 fax in half-duplex mode for negotiation and control.
V.22	Dial-up, leased	Duplex	1,200	300	
V.22bis	Dial-up	Duplex	2,400	1,200	Compatible with V.22.
V.23	Dial-up	Half-duplex	1,200	600	Specifies 75 bit/sec reverse channel.
V.27ter	Dial-up	Half-duplex	2,400, 4.8K	2,400	Used by Group 3 fax for image transfer.
V.29	4-wire leased	Duplex	9.6K	4.8K, 7.2K	Used by Group 3 fax for image transfer at 9.6K and 7.2K.
	2-wire leased, dial-up	Half-duplex			
V.32	2-wire leased, dial-up	Duplex	9.6K	4.8K	With V.42 provides 38.4K bit/sec throughput.
V.32bis	2-wire leased, dial-up	Duplex	14.4K	1,200, 4.8K, 7.2K, 9.6K, V.32	Has rapid rate renegotiation feature for fast speed changes.
V.32ter	2-wire leased, dial-up	Duplex	19.2K	16.8K, V.32, V.32bis	An AT&T specification that is compatible with V.32 and V.32bis.
V.33	4-wire leased	Duplex	14.4K	12K	
V.fast	2- and 4-wire leased, dial-up	Duplex	28.8K	19.2K, V.32bis	Not final yet; proprietary implementations are now reaching market.

bis = Consultative Committee on International Telephony and Telegraphy (CCITT) term designating a second-generation standard.

ter = The CCITT term designating a third-generation standard.

(1) V series standards, except for V.32ter and V.fast, are promulgated by CCITT.

SOURCE: TELECHOICE, INC., VERONA, N.J.

PEP mode, for instance, can be combined with V.42bis data compression to attain transmission speeds up to 70K bit/sec.

Almost all of the products in this Buyer's Guide support V.42/V.42bis and MNP 5, but some do not, such as Telebit's T3000 and Mass Microsystems, Inc.'s Mass FMV 144.

Errorless transmission

While compression helps guarantee high throughput, error-free transmission ensures data delivery. There are several protocols that deal with error control over a modem connection. Users should look for such protocol support because it will increase end-to-end transmission reliability.

The V.42 standard ensures error control over modem connections and is supported broadly across modem offerings. Some vendors, such as Octocom and Western DataCom, offer proprietary error control schemes.

The committee has two modes of error correction, per its standards, each with its own method of achieving error control for modems.

The CCITT prefers the Link Access Protocol (LAP) M protocol, while V.42 also supports MNP 2-4. There is no real performance difference between the two. Some older devices, however, don't support LAP M, so MNP is used for error correction with those devices.

In establishing a connection, two modems typically default to LAP M support and, if that is not found, will try MNP.

MNP 10 is quickly becoming another error correction standard for boosting throughput over adverse line conditions. By constantly adjusting the transmission speed and packet size of the data through the modem, MNP 10 increases perfor-

Corp. have announced that they will offer MNP 10 fallback/fall-forward technology on their respective V.32bis chip sets. These two vendors represent more than 70% of the current modem chip market.

Fallback/fall forward

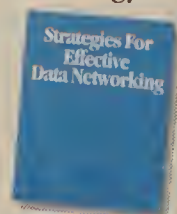
When modems encounter bad line conditions, most will step backward or fall back to a lower transmission speed in an

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The Short List: High-speed modems

This Short List highlights products Network World recommends you examine during the purchasing process for modems with throughput of at least 14.4K bit/sec. Criteria used to select items for this list varied by category of product as described below.



Proprietary V.fast, V.32ter modems

Modems in this category were judged on the basis of the following criteria: support for the emerging high-speed transmission standards, maximum throughput, support for error correction and data compression standards, ease of management and support for the widest range of communications links.

■ **AT&T Paradyne's Comsphere 3810:** The Comsphere 3810 supports AT&T's 19.2K bit/sec V.32ter specification. AT&T Paradyne plans to ship a proprietary implementation of the 28.8K bit/sec V.fast standard within the next few months. The 3810 has a maximum throughput of 115.2K bit/sec. The modem operates over dial-up connections, two- and four-wire leased lines and cellular links. Software enhancements can be downloaded over the phone from AT&T Paradyne. The modem supports two key security features — password protection and automatic callback — as well as the key error correction and data compression standards — Microcom Network Protocol 1-5 and V.42/V.42bis. Local and remote monitoring are also supported. Price: \$1,195.

■ **Motorola Codex's 3260 Fast:** This is the only modem currently shipping with an implementation of the emerging 28.8K bit/sec V.fast standard. The 3260 Fast has a maximum throughput of 115.2K bit/sec and operates over dial-up, two-wire leased and cellular connections. Four-wire leased lines are supported optionally. The modem comes with such features as local and remote network management, automatic callback, password protection and standards-based error correction and data compression. Facsimile support is not available. Price: \$1,395.

■ **Zypcom, Inc.'s Z32t-SX:** Zypcom's Z32t-SX supports AT&T Paradyne's 19.2K bit/sec V.32ter specification and has a maximum throughput of 115.2K bit/sec. Zypcom offers relatively low priced modems with a wide range of features and broad standards support. The Z32t-SX supports dial-up and two- and four-wire leased lines but not cellular links. It supports all four fax standards, the key error correction and data compression standards, plus local and remote management. Automatic callback and password protection are supported. Price: \$749.

V.32bis modems

Modems in this category were judged on the basis of the following criteria: breadth of features and standards supported at the lowest price, with particular attention paid to error correction, data compression and security.

■ **Penril DataComm Networks, Inc.'s Alliance V.32/14.4 and V.32/14.4M:** This pair of modems supports dial-up and two- and four-wire leased-line connections and operates with a maximum throughput of 115.2K bit/sec. The modems support the major fax, error correction and data compression standards. Penril DataComm plans to offer support for V.fast when that standard is final. Automatic callback and password protection are supported, as are fallback and fall-forward automatic speed renegotiation. Penril DataComm provides a proprietary management package and plans to offer a Simple Network Management Protocol agent within a year. Prices: \$875 to \$1,175.

■ **U.S. Robotics, Inc.'s Sportster 14,400:** Priced at \$229, the Sportster 14,400 is the lowest priced modem listed in the chart. The unit provides bare-bones V.32bis/V.42bis functionality with a maximum throughput of 57.6K bit/sec — and little else: no fax support, no passwords, no leased-line support, no net management and no 24-hour support. The unit does provide standard error correction and data compression, as well as fallback and fall-forward support.

■ **Zypcom, Inc.'s Z32b-SX:** Zypcom's low-end Z32b-SX is a 14.4K bit/sec V.32bis modem with a maximum throughput of 115.2K bit/sec. The modem sports broad functionality at a price of \$549. It supports fax, error correction and data compression standards as well as local and remote network management. Also supported is dial-up and leased-line operation. The ZX32b-SX supports digitized voice, caller identification and distinctive rings. ■

interfaces.

Modem management systems also provide reporting capabilities, enabling net managers to gather statistics when modems are accessed and when users are attempting multiple passwords to gain access to a modem.

Many of the more expensive modem management systems provide for loopback tests and local testing. Loopback is a type of diagnostic test in which a transmitted signal is returned to the sending device to locate a fault.

Local and remote testing are important capabilities. They allow the end user to perform a series of tests both locally on the modem attached to the computer and remotely through the network.

Remote configuration of modems remains a key feature for anyone attempting to manage modems at multiple sites.

Delta Air Lines, Inc. recently selected U.S. Robotics' Courier V.32bis Fax modem as the corporate standard for its 14.4K bit/sec modems. The company operates in 34 countries and has approximately 65 international offices, making remote configuration "a serious consideration," according to Rick Wood, a manager in Delta's Information Technologies Department.

"Having the ability to configure the modems by dialing in, rather than trying to talk the end user through the process, obviously saves a lot of time," he says. Only 45 of the modem vendors surveyed offer products that are remotely configurable.

While many modem vendors offer their own proprietary modem management

Another modem management feature worth considering allows the net manager to change parameters via software.

▲▲▲

or Outdated?

products, few currently support the Simple Network Management Protocol. Those that do include Best Data, Inc. and UDS Motorola. Others, including Penril DataComm Networks, Inc., Shiva Corp. and U.S. Robotics, plan to offer SNMP within 12 months.

Another modem management feature worth considering allows the net manager to change parameters via software, instead of setting dip switches.

For the security-minded buyer, many of the modems in this Buyer's Guide, such as CXR Telcom Corp.'s 1400 series of modems and Penril DataComm's modem line, come with password protection and automatic callback.

Few of the present providers of V.32bis modems include encryption in their products.

Applied Engineering, Telebit and Western DataCom offer modems with encryption as a standard feature.

"The demand from end users for en-
(continued on page 49)

High-speed modems

Company	Modem	Con- figu- ration	Bus	Inter- faces	Standards and speeds supported (bit/sec)							Max. through- put (K bit/sec)	Modes	Error correction and data compres- sion	Features			Back- up	Fax stan- dards	Cel- lular	Se- cu- rity	Mgt.	Price/ warranty (months) L = Life- time	
		E = External I = Internal R = Rack-mountable			E = EISA I = ISA M = MCA P = PCMCIA O = Other	M = MAC 8-pin DIN R = RS-232 V = V.35 O = Other	Proprietary V.fast Proprietary 14.4 K-28.8K V.32bis/14.4K V.33/14.4K V.29/9.6K V.27ter/4.8K V.23/1,200								A = Autosynchronization F = Full-duplex H = Half-duplex S = Synchronous A = Adjustable transmit level 2 = 2-wire leased 4 = 4-wire leased	1 = MNP 1-5 2 = MNP 10 P = Proprietary V = V.42V.42bis	V.25bis (autodial) Echo suppression							Fall forward A = Automatic M = Manual
Applied Engineering (800) 554-6227	DatalinkPB	I	PB				✓	✓	✓	✓	✓	57.6	A, F, H, S		1, 2, V	✓	✓	✓		1, 2, G, V	✓	A, P		\$525/12
AT&T Paradyne (800) 482-3333, Ext. 586	Comsphere 3810	E		R	✓ (1)	✓	✓	✓	✓			115.2	F, H, S	A, 2, 4	1, V	✓		✓	A, M		✓	A, P	L, R, S	\$1,195/24
	Comsphere 3820	E		R	✓ (1)	✓	✓					115.2	F, H, S	A, 2	1, V	✓		✓			✓	A, P	L, R, S	\$995/24
	DataPort 14.4 Data/Fax PC Modem	I	E				✓			✓		57.6	F		1, V			✓		1, G	✓			\$505/L
	DataPort 14.4 Data/Fax	E		M, R			✓			✓		57.6	F, S	A	1, V			✓		1, G	✓			\$555/L
	Comsphere 3811	R		R	✓ (1)	✓	✓	✓	✓			115.2	F, H, S	A, 2, 4	1, V	✓		✓	A, M		✓	A, P	L, R, S	\$1,195/24
	Comsphere 3830	E		R	✓ (1)	✓	✓					115.2	F, H, S	A, 2	1, V	✓		✓			✓	A	R, S	\$795/24
	Keep In Touch 14.4 Data/Fax	I	P				✓				✓	57.6	A, F, S	A	1, V			✓		1, 2, G, V	✓		S	\$599/60
Best Data, Inc. (818) 773-9600	Smart One 1442F	R					✓		✓	✓		57.6	A, F, H, S	2, 4	1, V	✓		✓	M	1, 2, G, V			S	\$399/24
	Smart One 1442FX	E		R			✓		✓	✓		57.6	A, F, H, S	2	1, V	✓		✓	M	1, 2, G, V			S	\$399/24
Boca Research, Inc. (407) 997-6227	14.4K bps External Bocamodem	E		M, R			✓		✓	✓	✓	57.6	F, H		1, V (2)			✓		1, 2, G, V				\$495/60
	14.4K bps Internal Bocamodem	I	I				✓		✓	✓	✓	57.6	F, H		1, V (2)			✓		1, 2, G, V				\$395/60
Cardinal Technologies, Inc. (717) 293-3000	14400V.32bis	E		R			✓		✓	✓		57.6	F, S		1, V		✓			1, 2, G, V				\$449/L
	14450V.32bis	I	O				✓		✓	✓		57.6	F, S		1, V		✓			1, 2, G, V				\$339/L
CXR Telcom Corp. (408) 435-8520	1453-Am	R		R			✓			✓		115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M			A, P	L, R	\$825/12
	1451-Am	R		R			✓			✓		115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M			A, P	L, R	\$995/12
	1445-FXD	I	E, I				✓		✓	✓	✓	115.2	F, H	A	1, V		✓	✓		1, 2, G, V		A, P		\$650/12
	1445-FX1	E		R			✓		✓	✓	✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	1, 2, G, V		A, P	L, R	\$795/12
	1445-FXD1	E		R			✓		✓	✓	✓	115.2	F, H, S	A	1, V	✓	✓	✓		1, 2, G, V		A, P	L, R	\$695/12
								(3)	(3)	(3)	(3)													
Data Race, Inc. (800) 329-7223	RediCard V.32bis/Fax	I	P				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/12
	RediModem V.32bis/Fax (PC1/2 card)	I	I				✓		✓	✓		38.4	A, F, H	A, 2	1, V	✓	✓	✓		1, G			S	\$595/12
	RediModem Apple PowerBook 140, 160, 170, 180	I	M				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/60
	RediModem Toshiba E-Slot	I	O				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/60
	RediModem Compaq Lite	I	O				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/60
	RediModem Compaq Contura	I	O				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/60
	RediModem IBM ThinkPad 700 and 700C	I	O				✓		✓	✓		38.4	A, F, H	A	1, P, V	✓	✓	✓		1, G, V	✓		S	\$595/60
Digicom Systems, Inc. (408) 262-1277	ScoutPlus	I	E				✓		✓	✓		57.6	F		1, V		✓	✓		1, G				\$249/60
	ScoutPlus	E		R			✓		✓	✓		57.6	F		1, V		✓	✓		1, G				\$289/60
	ScoutPlus for the Mac	E		M			✓		✓	✓		57.6	F		1, V		✓	✓		1, G				\$299/60
Dove Computer Corp. (919) 343-5629, (800) 849-3297	DoveFax Pro	E		R			✓		✓	✓		57.6	F, H		1, V		✓	✓		1, 2, G, V				\$599/36
	DoveFax 144E	E		R			✓		✓	✓		57.6	F, H		1, V		✓			1, G				\$479/36
FastComm Communications Corp. (800) 521-2496	FDX 9642T	R		R			✓			✓		57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M			A, P	L	\$799/24
Focus Enhancements, Inc. (800) 538-8866	Focus Fax Modem 14.4 PB	I	P				✓		✓	✓		57.6	A, F, H, S	A	1, V				A, M	1, G, V (2)				\$300/36
	Focus 14.4 Data and Fax Modem	E		M, R			✓		✓	✓		57.6	A, F, H, S	A	1, V				A, M	1 (2)				\$299/36

High-speed modems (continued on page 46)

Company	Modem	Con- figu- ration	Bus	Inter- faces	Standards and speeds supported (bit/sec)						Max. through- put (K bit/sec)	Modes		Error correction and data compression	Features		Back- up	Fax stand- ards	Cel- lular	Se- cu- rity	Mgt.	Price/ warranty (months) L = Life- time	
		E = External I = Internal R = Rack-mountable			E = EISA I = ISA M = MCA P = PCMCIA O = Other	M = MAC 8-pin DIN R = RS-232 V = V.35 O = Other	Proprietary V.fast	Proprietary 14.K-28.8K	V.32bis/14.4K	V.33/14.4K		V.29/9.6K	V.27ter/4.8K		V.23/1,200	A = Autosynchronization F = Full-duplex H = Half-duplex S = Synchronous							A = Adjustable transmit level 2 = 2-wire leased 4 = 4-wire leased
Forval America, Inc. (801) 561-8777	IM 14400	I	I			✓					14.4	F, H	A	1, V (2)		✓		A, M				\$945/60	
	SA 14400	E		R		✓					14.4	F, H, S	A	1, V (2)		✓		A, M				\$995/60	
General DataComm, Inc. (800) 777-4005	GDC 914 ADR	E		M, R		✓			✓		38.4	F, S	A, 2, 4	1, V	✓	✓	✓	A, M		A, P		\$995/12	
	GDC 914 Pocket	E		M, R		✓					38.4	F, S		1, V		✓	✓		2, G, V			\$725/12	
	SpectraComm 914 ADR	R		M, R		✓			✓		38.4	F, S	A, 2, 4	1, V	✓	✓	✓	A		A, P		\$945/12	
	GDC 914 Stand-alone	E		M, R		✓			✓		38.4	F, S	A, 2	1, V		✓	✓					\$795/12	
	GDC 914 PC	I	E			✓				✓	38.4	F, S	2	1, V		✓	✓					\$695/12	
	Optima 144	E		M, R		✓	✓	✓	✓	✓	57.6	A, F, H		1, V		✓						\$479/60	
Hayes Microcomputer Products, Inc. (404) 840-9200	Optima 144 + Fax 144 Pocket Edition	E		M, R		✓	✓	✓	✓	✓	57.6	A, F, H		1, V		✓			1, G, V			\$599/60	
	Optima 144 + Fax 144	E		M, R		✓	✓	✓	✓	✓	57.6	A, F, H, S		1, V		✓			1, G, V			\$519/60	
	Optima 144B + Fax 144	I	E			✓	✓	✓	✓	✓	57.6	A, F, H		1, V		✓			1, G, V			\$519/60	
	Ultra 144	E		M, R		✓	✓			✓	38.4	A, F, H, S	2	1, P, V	✓	✓						\$999/24	
	SatisFAXtion Modem 400	I	E, I			✓		✓	✓		57.6	F, H	2	1, V		✓	✓		G, V			\$499/36	
Intel Corp. (800) 538-3373	SatisFAXtion Modem 400e	E		R		✓		✓	✓		57.6	F, H, S	2	1, V		✓	✓		1, G			\$499/36	
	Intel 14.4EX Modem	E		R		✓		✓	✓		57.6	F, H, S	2	1, V		✓	✓					\$549/36	
	SatisFAXtion Modem 300	I	E, I			✓		✓	✓		57.6	F, H		1, V		✓			1, G			\$369/36	
	Mass FMV 144	E		M		✓					57.6	A, F, H, S	A, 2	1, V (2)			✓		1, G, V			\$499/12	
Mass Microsystems, Inc. (800) 522-7979 Megahertz Corp. (801) 272-6000	Megahertz PCMCIA Notebook Data/Fax Modem	I	P			✓			✓	✓	57.6	A, F, H, S	2	1, V	✓				1, 2, G, V			\$599/60	
	Megahertz 14.4 bps Pocket Data/Fax Modem	E		R		✓			✓	✓	57.6	A, F, H, S	2	1, V					1, 2, G, V			\$499/60	
	Megahertz 14.4 bps Notebook Data/Fax Modems	I	E			✓			✓	✓	57.6	A, F, H, S	2	1, V					1, 2, G, V			\$669/60	
	QX/4232bis+	E, R		R		✓				✓	57.6	F, H, S	A, 2, 4	1, 2, V	✓	✓	✓	A, M		✓	A, P		\$1,099/12
Microcom, Inc. (617) 551-1000	MicroPorte 4232bis with Fax	E		R		✓					57.6	F, H		1, 2, V	✓	✓	✓		1, G	✓	P		\$899/12
	QX/4232bis	E, R		R		✓					57.6	F, H, S	2	1, 2, V	✓	✓	✓			✓	P		\$899/12
	MG 144i	I	I			✓					57.6	F, H, S	A	1, V (2)		✓			1, 2, G, V (4)			S	\$699/12
MicroGate Corp. (800) 444-1982	MG 144m	I	M			✓					57.6	F, H, S	A	1, V (2)		✓			1, 2, G, V (4)				\$799/12
	3260 Fast	E		R	✓	✓					115.2	F, H, S	A, 2, 4	1	✓	✓	✓	M		✓	A	L, R, S	\$1,395/24
Motorola Codex (508) 261-4183	3262 Fast Card	R		R	✓	✓					115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	M		✓	A, P	L, R, S	\$2,395/24
	3261 Fast	E		R	✓	✓					115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M		✓	A, P	L, R, S	\$1,695/24
	3263 Fast Card	R		R	✓	✓					115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M		✓	A, P	L, R, S	\$1,645/24
	3260	E		R		✓					57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	M		✓	A, P	L, R, S	\$1,095/24
	3262	E		R		✓					57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	M		✓	A, P	L, R, S	\$2,095/24
	3261	E		R		✓					57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M		✓	A, P	L, R, S	\$1,195/24
	3263 Card	E		R		✓					57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M		✓	A, P	L, R, S	\$1,145/24
	3220 Plus	E		R							38.4	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M		✓		S	\$795/24
	MT1432PCS	E		R		✓				✓ (5)	57.6	F, H, S	A, 2	1, V (2)	✓	✓	✓	A, M	2, G, V		A, P	S	\$1,149/24
Multi-Tech Systems, Inc. (800) 328-9717	MT1432MU-MAC	E		M		✓				✓ (5)	57.6	F, H	A	1, V (2)		✓	✓		2, G, V		A, P	S	\$729/60

FOOTNOTES:

- (1) Product will ship within 3 months.
 (2) Vendor only supports a subset of MNP 1-5.
 (3) Speed supported in fax mode only.
 (4) Supported as extra option.
 (5) Domestic models do not support V.23; international models do.
 (6) Chassis option ranges from \$1,095-\$2,295.
 (7) Chassis option ranges from \$1,299-\$2,099.

EIA = Electronic Industries Association
 EISA = Extended Industry Standard Architecture
 ISA = Industry Standard Architecture
 MCA = Micro Channel Architecture
 MNP = Microcom Networking Protocol
 PCMCIA = Personal Computer Memory Card International Association

SOURCE: TELECHOICE, INC., VERONA, N.J.

High-speed modems (continued from page 45)

Company	Modem	Con-figuration	Bus	Inter-faces	Standards and speeds supported (bit/sec)						Max. throughput (K bit/sec)	Modes			Error correction and data compression	Features			Back-up	Fax standards	Cellular	Security	Mgt.	Price/warranty (months) L = Life-time
		E = External I = Internal R = Rack-mountable	E = EISA I = ISA M = MCA P = PCMCIA O = Other	M = MAC 8-pin DIN R = RS-232 V = V.35 O = Other	Proprietary V.fast	Proprietary 14.4K-28.8K	V.32bis/14.4K	V.33/14.4K	V.29/9.6K	V.27ter/4.8K	V.23/1,200		A = Autosynchronization F = Full-duplex H = Half-duplex S = Synchronous	A = Adjustable transmit level 2 = 2-wire leased 4 = 4-wire leased	1 = MNP 1-5 2 = MNP 10 P = Proprietary V = V.42/V.42bis	V.25bis (autodial)	Echo suppression	Fall forward	A = Automatic M = Manual	1 = EIA Class 1 2 = EIA Class 2 G = G.3 FAX/9.6K bit/sec V = V.17 FAX/14.4K bit/sec		A = Auto callback P = Passwords	L = Local R = Remote S = Software controllable	
Multi-Tech Systems, Inc. (800) 328-9717	MultiModemLAN (MT1432ECT)	E		M, O, R		✓					✓ (5)	57.6	F, H	A	1, V (2)	✓	✓			2, G, V		A, P	S	\$1,999/24
	MultiModemU (MT1432MU)	E		R		✓					✓ (5)	57.6	F, H	A	1, V (2)	✓	✓	✓		2, G, V		A, P	S	\$729/60
	MT1432BR	R		R		✓					✓ (5)	57.6	F, H	A, 2	1, V (2)	✓	✓	✓	M	2, G, V		A, P	S	\$830/24
	MultiModem II (M1432BC)	I	E, I			✓					✓ (5)	57.6	F, H	A	1, V (2)	✓	✓	✓		2, G, V		A, P	S	\$899/72
	MultiModem II (MT1432 BL)	E		R		✓					✓ (5)	57.6	F, H, S	A, 2, 4	1, V (2)	✓	✓	✓	A, M	2, G, V		A, P	S	\$999/60
	MultiModem II (MT1432ES)	I	M			✓					✓ (5)	57.6	F, H	A	1, V (2)	✓	✓	✓		2, G, V		A, P	S	\$899/24
	MT1432MR	R		R		✓					✓ (5)	57.6	F, H, S	A, 2, 4	1, V (2)	✓	✓	✓	A	2, G, V		A, P	L, S	\$2,999 (3 modems)/24
	MT1432BLR	E		R		✓					✓ (5)	57.6	F, H, S	A, 2, 4	1, V (2)	✓	✓	✓	A, M	2, G, V		A, P	S	\$930/60
	MT1432BA	E		R		✓					✓ (5)	57.6	F, H, S	A, 2	1, V (2)	✓	✓	✓	M	2, G, V		A, P	S	\$899/60
NEC America, Inc.'s Data Communication Systems Division (800) 422-4632	N9635E Plus	E		R		✓						38.4	F, H, S	A, 2, 4	1, V	✓			A, M				L, R, S	\$1,199/12
	I9635E Plus	R		R		✓						38.4	F, H, S	A, 2, 4	1, V	✓			A, M				L, R, S	\$1,325/12
Octocom Systems, Inc. (800) 989-8888	Xpresso 8392A	E		R		✓	✓	✓	✓			38.4	F, H, S	4	P	✓	✓	✓				A, P	L, R, S	\$1,795/24
	Xpresso 8196A	E		R		✓					✓	38.4	F, H, S	2	1, V	✓	✓	✓				A, P	L, R, S	\$825/24
	Xpresso 8392R	R		M, R		✓	✓	✓	✓			38.4	F, H, S	4	P	✓	✓	✓				A, P	L, R, S	\$1,795/24
	Xpresso 8396R	R		M, R		✓	✓	✓	✓	✓	✓	38.4	F, H, S	2, 4	1, V	✓	✓	✓				A, P	L, R, S	\$1,095/24
	Xpresso 8396A	E		R		✓	✓	✓	✓	✓	✓	38.4	F, H, S	2, 4	1, V	✓	✓	✓				A, P	L, R, S	\$1,095/24
Penril DataComm Networks, Inc. (800) 473-6745	DX 144	E		R		✓	✓	✓	✓	✓	✓	115.2	A, F, H, S	A	1, V	✓		✓	M	1, 2, G, V		A, P	L, R, S	\$595/12
	Alliance V.32/14.4, Alliance V.32/14.4M	R		R		✓	✓	✓	✓	✓	✓	115.2	A, F, H, S	A, 2, 4	1, V	✓		✓	A, M	1, 2, G, V		A, P	L, R, S	\$875-\$1,175/12
	Alliance V.32/19.2, Alliance V.32/19.2M	R		R		✓	✓	✓	✓	✓	✓	115.2	A, F, H, S	A, 2, 4	1, V	✓		✓	A, M	1, 2, G, V		A, P	L, R, S	\$1,295-\$1,495/12
Practical Peripherals, Inc. (800) 442-4774	PM14400FXSA	E		M, R		✓			✓	✓		57.6	A, F, S	2	1, V (2)	✓	✓			1, 2, G, V				\$549/L
	PM14400FX PKT	E		M, R		✓			✓	✓		57.6	A, F	2	1, V (2)	✓	✓			1, 2, G, V				\$499/L
	PM14400FXMT	E		M, R		✓			✓	✓		57.6	A, F, S	2	1, V (2)	✓	✓			1, 2, G, V				\$399/L
	PM14400FX	I	E, I			✓			✓	✓		57.6	A, F	2	1, V (2)	✓	✓			1, 2, G, V				\$499/L
	PM14400FX PS/2	I	M			✓			✓	✓		57.6	A, F	2	1, V (2)	✓	✓			1, 2, G, V				\$599/L
PSI Integration, Inc. (800) 622-1722	PowerModem IV	I	PB			✓			✓	✓	✓	57.6	F, H	A	1, V					1, 2, G, V				\$495/12
	COMstation Five	E		M, R		✓			✓	✓		57.6	F, H, S	A	1, V					1, G, V				\$545/12
Racal-Datcom, Inc. (800) 722-2555	ALM 3223	E		M, R		✓	✓				✓	57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	2, G, V		A, P	L, R, S	\$1,145/24
	ALM 3226	E		M, R		✓				✓		57.6	F, S	A, 2	1, V	✓		✓		1	✓	A, P	L, R, S	\$750/24
	ALM 3239	E		M, R	✓	✓	✓				✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M			A, P	L, R, S	\$1,695/24
Shiva Corp. (617) 270-8500	NetModem/E	E		O		✓						57.6	F, S		1, V	✓		✓				A, P	L, R, S	\$1,699/8
Telebit Corp. (408) 734-4333, (500) 835-3248	World Blazer	E, R		M, R		✓	✓				✓	115.2	F, H, S	2		✓	✓			2, G		A, P	L, R, S	\$1,099/24
	T3000	E, R		M, R		✓					✓	57.6	F, S	2	1, V (2)	✓	✓			2, G		A, P	L, R, S	\$949/3
TWINCOM (919) 395-5100	TWINCOM 14.4 PRO	E		M		✓			✓	✓		57.6	F, H, S	2	1, V		✓			1, 2, G, V				\$499/24
	TWINCOM 14.4 DF	E		R		✓			✓	✓		57.6	F, H, S	2	1, V		✓			1, 2, G, V				\$499/24
	TWINCOM 14.4 DFI	I	E			✓			✓	✓		57.6	F, H, S	2	1, V		✓			1, 2, G, V				\$449/24
	TWINCOM 14.4 PowerTwin	I	PB			✓			✓	✓	✓	57.6	F, H, S	2	1, V	✓	✓	✓		1, 2, G, V				\$449/24
	TWINCOM Voyager	E		R		✓			✓	✓	✓	57.6	F, H, S	2	1, V		✓			1, 2, G, V				\$549/24
UDS Motorola (205) 430-8000	GlobalView V.32b	R		R		✓			✓	✓		57.6	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	G, V		A, P	L, R, S	\$1,425/24
	V.3229	R		R		✓	✓					57.6	F, H, S	A, 2, 4	1, V (2)	✓		✓	A, M			P	R, S	\$770-\$995/24
	Fastalk Fax 32bx	E		R		✓			✓	✓		57.6	F, S	A, 2	1, V	✓	✓	✓		1, G			R, S	\$845/24
	V.3257	R		R		✓						57.6	F, H, S	A, 2, 4	1, V (2)	✓		✓	A, M	1, G, V		A, P	R, S	\$1,145/24

High-speed modems

Company	Modem	Con-figuration	Bus	Inter-faces	Standards and speeds supported (bit/sec)							Max. through-put (K blt/sec)	Modes		Error correction and data compression	Features		Back-up	Fax stan-dards	Cel-lular	Se-curity	Mgt.	Price/warranty (months) L = Life-time
		E = External I = Internal R = Rack-mountable			E = EISA I = ISA M = MCA P = PCMCIA O = Other	M = MAC 8-pin DIN R = RS-232 V = V.35 O = Other	Proprietary V.fast	Proprietary 14.K-28.8K	V.32bis/14.4K	V.33/14.4K	V.29/9.6K		V.27ter/4.8K	V.23/1,200		A = Autosynchronization F = Full-duplex H = Half-duplex S = Synchronous	A = Adjustable transmit level 2 = 2-wire leased 4 = 4-wire leased						
U.S. Robotics, Inc. (800) 342-5877	Shared Access Modem Sharing Kit	E		R		✓				✓	57.6	F, H		1, V (2)	✓	✓				A, P	S	\$795-\$1,395/60	
	Shared Access Communication Server 386	E		R		✓				✓	57.6	F, H		1, V (2)	✓	✓				A, P	S	\$1,995/24	
	Shared Access LAN modem	E		R		✓				✓	57.6	F, H		1, V (2)	✓	✓				A, P	S	\$1,695/24	
	Courier V.32bis	E, I, R	E, M	R		✓				✓	57.6	F, H, S	2	1, V (2)	✓	✓						\$645-\$1,495/24 (6)	
	Courier V.32bis Fax	E, I, R	E, M	R		✓		✓	✓	✓	57.6	F, H, S	2	1, V (2)	✓	✓		1, G				\$745-\$1,595/24 (6)	
	Courier HST Dual Standard	E, I, R	E, M	R		✓				✓	57.6	F, H, S	2	1, V (2)	✓	✓						\$1,149-\$2,100/24 (6)	
	Courier HST Dual Standard Fax	E, I, R	E, M	R		✓		✓	✓	✓	57.6	F, H	2	1, V (2)	✓	✓		1, G				\$1,295-\$2,200/24 (6)	
	Sportster 14,400	E, I	E	R		✓				✓	57.6	F, H		1, V (2)	✓	✓						\$229-\$259	
	Sportster 14,400 Fax	E, I	E	R		✓		✓	✓	✓	57.6	F, H		1, V (2)	✓	✓		1, G, V				\$259-\$299	
	WorldPort 14,400	E		R		✓				✓	57.6	F, H, S	2	1, V (2)	✓	✓						\$599/24	
	WorldPort 14,400 Fax	E		R		✓		✓	✓	✓	57.6	F, H, S	2	1, V (2)	✓	✓		1, G, V				\$649/24	
	WorldPort 14,400 Fax for the Apple PowerBook	E		R		✓		✓	✓	✓	57.6	F, H, S	2	1, V (2)	✓	✓		1				\$699/24	
Western DataCom Co. (800) 262-3311	WorldCom V.32 bis	E		R		✓		✓	✓	✓	115.2	F, S	A, 4	2, V (2)	✓			1, 2, G	✓			\$695/12	
	656 Quadra Pump	E		V		✓					96	F, S	A, 4	P	✓		A			L, R, S		\$2,495/12	
Zypcom, Inc. (510) 783-2501	Z32b-PX	E		M, R		✓		✓	✓	✓	57.6	F	A	1, 2, V	✓	✓		1, 2, G, V	✓	P		\$469/24	
	Z32b-SX	E		M, R		✓		✓	✓	✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	1, 2, G, V		A, P	L, R, S	\$549/24
	Z32t-SX	E		M, R	✓	✓		✓	✓	✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	1, 2, G, V		A, P	L, R, S	\$749/24
	Z32b-RX	E		R		✓		✓	✓	✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	1, 2, G, V		A, P	L, R, S	\$499/24
	Z32t-RX	R		R	✓	✓		✓	✓	✓	115.2	F, H, S	A, 2, 4	1, V	✓	✓	✓	A, M	1, 2, G, V		A, P	L, R, S	\$699/24
ZyXEL (714) 693-0808	ZyXEL U-1496 plus (IBM-PC)	E		R		✓	✓	✓	✓	✓	76.8	F, H, S	A, 2, 4	1, V (2)	✓		✓	A, M	2, G, V	✓	A, P	R, S	\$989/60
	ZyXEL U-1496 plus (Windows)	E		R		✓	✓	✓	✓	✓	76.8	F, H, S	A, 2, 4	1, V (2)	✓		✓	A, M	2, G, V	✓	A, P	R, S	\$1,019/60
	ZyXEL U-1496 plus (Macintosh)	E		M, R		✓	✓	✓	✓	✓	76.8	F, H, S	A, 2, 4	1, V (2)	✓		✓	A, M	2, G, V	✓	A, P	R, S	\$1,039/60
	ZyXEL U-1496E plus (Macintosh)	E		M, R		✓	✓			✓	76.8	F, H, S	A, 2, 4	1, V (2)	✓		✓	M	2, G, V	✓	A, P		\$699/60
	ZyXEL U-1496E plus (IBM-PC)	E		R		✓	✓			✓	76.8	F, H, S	A, 2	1, V (2)	✓		✓		2, G, V	✓	A, P		\$649/60
	ZyXEL U-1496E plus (Windows)	E		R		✓	✓			✓	76.8	F, H, S	A, 2	1, V (2)	✓		✓			✓	A, P		\$679/60
	ZyXEL U-1496B plus (Windows)	I	I			✓	✓			✓	57.6	F, H	A, 2	1, V (2)	✓		✓			✓	A, P		\$659/60
	ZyXEL U-1496B plus (IBM-PC)	I	I			✓	✓			✓	57.6	F, H	A, 2	1, V (2)	✓		✓			✓	A, P		\$629/60
	ZyXEL U-1496B plus (Windows)	I	I			✓				✓	57.6	F, H	A, 2	1, V (2)	✓		✓			✓	A, P		\$479/60
	ZyXEL U-1496R	R		R		✓	✓	✓	✓	✓	76.8	F, H, S	A, 2, 4	1, V (2)	✓		✓	M		✓	A, P	L, R, S	\$989/60 (7)
	ZyXEL U-1496B (DOS-IBM-PC)	I	I			✓				✓	57.6	F, H	A, 2	1, V (2)	✓		✓			✓	A, P		\$449/60
	ZyXEL U-1496E (Macintosh)	E		M, R		✓				✓	57.6	F, H, S	A, 2	1, V (2)	✓		✓			✓	A, P		\$519/60
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	ZyXEL U-1496E (Windows)	E		R		✓				✓	57.6	F, H, S	A, 2	1, V (2)	✓		✓			✓	A, P		\$499/60

Products highlighted by color were selected for The Short List.

FOOTNOTES:

- (1) Product will ship within 3 months.
- (2) Vendor only supports a subset of MNP 1-5.
- (3) Speed supported in fax mode only.
- (4) Supported as extra option.
- (5) Domestic models do not support V.23; international models do.
- (6) Chassis option ranges from \$1,095-\$2,295.
- (7) Chassis option ranges from \$1,299-\$2,099.

EIA = Electronic Industries Association
 EISA = Extended Industry Standard Architecture
 ISA = Industry Standard Architecture
 MCA = Micro Channel Architecture
 MNP = Microcom Networking Protocol
 PCMCIA = Personal Computer Memory Card International Association

SOURCE: TELECHOICE, INC., VERONA, N.J.



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 4 ☐ Within 60 days 6 ☐ Within one year
 5 ☐ Within six months

3. Scope of purchase responsibility
 7 ☐ Enterprise wide 8 ☐ Departmental

4. Purchase influence/number of sites
 9 ☐ one site 11 ☐ 10-20 sites
 10 ☐ 2-9 sites 12 ☐ 21+ sites

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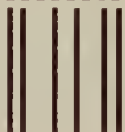
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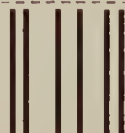
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(continued from page 43)
 crypton features has not been there yet," Multi-Tech's Heimerman says. "The transmission providers are dealing with this in

prices. Nearly half of the V.32bis modems cost less than \$500. A few of the more feature-rich modems cost more than \$1,000; these often come with leased-line

U.S. Robotics' Sportster 14,400, which costs \$229.

Of course, the listed prices are all manufacturers' suggested retail prices. Street prices differ; discounts of 30% to 40% are generally available for volume purchases.

Finally, warranties are critical. Some vendors, such as AT&T Paradyne, offer lifetime warranties on their products. Others, such as MicroGate Corp. and NEC America, Inc.'s Data Communication Systems Division, offer only one-year warranties. All warranties cover parts and labor.

V.faster?

The trend toward smaller, faster and cheaper will continue. PCMCIA-based modems, which will address the need for portable modem transmission technology in a small package, will likely

take off in 1994.

In terms of faster, the next step beyond V.fast is unclear. "We're quickly approaching theoretical [throughput] limits with modems," says Microcom's Kopeck. "There's nothing on the horizon that we can look to beyond V.fast for faster speeds."

As the market continues to change, users are looking to existing vendors to provide a migration path to faster speeds.

How soon will users migrate to higher speeds such as V.fast? That will depend largely on high-bandwidth applications that drive the need for greater modem throughput.

Many application developers say they are waiting for end users to demand such applications. However, users are saying they will wait until the new technology is proven.

"We want to be close to the leading edge of technology, but we have to be cost-effective as well," says Richard Holder, product marketing manager at WordPerfect Corp., which expects to evaluate both V.32ter and V.fast in the near future. But for now? "No one's asked for it."

As for lower prices, with more than 20 new modem models announced and on the way, one can only surmise that competition will keep costs on their downward trend. □

Brtere is president of TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (210) 239-0700 or via MCI Mail at DBRIERE or 445-4690.

Modem error control and compression

Figure 2

Standard	Description
V.42 (1)	Specifies both Microcom Networking Protocol (MNP) 2-4 and Link Access Procedure (LAP) M error correction standards for full-duplex modems. V.42 is compatible with V.22, V.22bis, V.26ter, V.32, V.32bis and the proprietary versions of V.32ter and V.fast.
V.42bis	A data compression protocol that theoretically allows up to 4-to-1 file compression.
V.54	A standard for local- and remote-loop test devices in modems.
LAP M	The preferred error control protocol specified by the V.42 standard for error control in modems.
MNP 1	An asynchronous, half-duplex error correction protocol for modems with few hardware resources. MNP 1 has been superseded by subsequent versions.
MNP 2-4	Part of the V.42 standard for error control. They allow for a range of error correction methods over asynchronous and synchronous links.
MNP 5	A data compression protocol that provides a 2-to-1 compression ratio.
MNP 10	Optimizes modem performance over adverse line conditions and cellular links.

bis = Consultative Committee on International Telephony and Telegraphy (CCITT) term designating a second-generation standard.
 ter = CCITT term designating a third-generation standard.

(1) V series standards, except for V.32ter and V.fast, are promulgated by the CCITT.

SOURCE: TELECHOICE, INC., VERONA, N.J.

their own way."

The good news about modems is that they are getting even less expensive. Vendors expect prices to drop 10% to 15% during the next year as competition heats up.

Already, prices are fairly competitive with historical modem

support, auto dial backup and net management.

On a cost/performance rating, you can buy a 2,400 bit/sec modem for \$100 to \$150 or a modem that runs 12 times faster for as low as \$795.

The least expensive V.32bis modem in the Buyer's Guide is

Letters

continued from page 39

and, of course, Asynchronous Transfer Mode years in advance of a standard.

While one can argue about the virtues of de facto vs. de jure standards forever, eventually the end user wants multivendor interoper-

erability, not proprietary solutions, which is what many of the currently discussed products seem to be.

Consider the plight of us test equipment vendors. . .

Jim Hayes
 President
 Fotec, Inc.
 Boston

CeBIT demos show PDAs

continued from page 34

ments, he said.

"We think that in the initial phases of the [PDA] market, commonality with desktop machines and sharing information with desktops" will be important to users, he said. "Ours is a more difficult approach to pull off [than Apple's], and we will have to work harder to achieve it, but if we can deliver it, it will be better for the customer."

Hardware vendors, including Compaq and IBM, are also eyeing Intel-compatible PDA products. Compaq and Microsoft are planning a joint announcement on PDA technology that could be made public as soon as next month, according to one well-placed source. Meanwhile, a source within IBM's PC division said IBM is planning a fourth-quarter release of a PDA using its own line of low-power Intel-compatible processors.

Also in the Intel-compatible camp at CeBIT was Nimble Computers, Inc. a California start-up demonstrating NimblePad. The machine uses 386 and 486 processors from Advanced Micro Devices, Inc. and runs Windows for Pen Computing, as well as a pen shell for DOS. By adding the NimbleComm module, the system can act as a cellular telephone and send and receive facsimiles.

However, the NimblePad — scheduled for availability in sample quantities in June — was displayed inside a glass case and not demonstrated because the prototype unit may still have a few bugs, said John Cannizzo III, the company's president. Tandy's Zoomer personal communicator was also displayed under glass without a live demonstration. □

IDG News Service Correspondents Cara Cunningham, Elizabeth Hetchler, David Kellar, Martin LaMontica and J. Robert Lineback contributed to this story.

Modem buyers mull all the options

If network managers were to buy high-speed modems today, many would be undecided about which brand to select and the majority would swear no allegiance to any one supplier, according to the most recent *Network World/Focus Data*, Inc. survey.

The survey also finds that buyers want advanced features and functionality for new high-speed modems.

Only one vendor, Hayes Microcomputer Products, Inc., manages to gain more than 10% of respondents' support for new purchases, although participants name 33 other vendors they would prefer as new high-speed modem suppliers.

Interestingly, 21% of respondents are undecided about who

reliable."

In fact, modem reliability tops respondents' list of key selection criteria to consider when evaluating modems, followed closely by conformance to standards and performance (see "Top selection criteria").

In verbatim comments taken from respondents on an anonymous basis, net managers also indicates the need for high-speed modems to support such advanced features and functions as data compression and error control.

In addition, user wish lists include support for facsimile traffic, field upgradability due to flexible designs based on firmware, and built-in security. On the subject of net management, respondents echo a call for Simple Network Management Protocol support and better remote management.

While respondents indicate reliability, conformance to standards and performance are their top selection criteria, they also largely express satisfaction with their current vendors' ability to meet those criteria. Still, respondents give their lowest satisfaction rating to vendors' ability to deliver adequate network management systems.

Repeatedly, users express dissatisfaction with the abilities of existing modem management systems. Some indicate a need for a single management system to create an umbrella system to control disparate modems. Numerous respondents called for better remote diagnostics.

"Network management is still a bit weak," says one respondent. "Proprietary modem management systems pose a

problem; it would be nice if they were all compatible and we could get them all under one management system."

With regard to service and support issues, network manag-

Preferred modem suppliers

Vendors that users would select for modems, ranked in order of preference:

- Hayes Microcomputer Products, Inc.
- Practical Peripherals, Inc.
- U.S. Robotics, Inc.
- Motorola Codex
- UDS Motorola
- Microcom, Inc.
- AT&T Paradyne

SOURCE: FOCUS DATA, INC., FRAMINGHAM, MASS.

ers say integration services rank as their first priority, followed by remote monitoring, ease of installation and maintenance or service programs.

On average, respondents say they prefer to spend about \$1,125 for a high-speed modem, which is on par with the \$1,195 price of AT&T Paradyne's Comsphere 3810, which is on *Network World's* Short List.

Respondents say they expect a discount of about 23% for purchases of an average 28 modems.

— Charles Bruno

Focus Data is a Framingham, Mass., market research house that specializes in surveys that probe the trends and usage of networks and information systems.

For additional information, contact Mona Dabbon at (508) 626-2556.

Top selection criteria

Based on highest possible score of 10

Reliability	9.28
Conformance to standards	9.27
Performance	9.14
Ease of use	7.75
Fall-back speed support	7.65
Service and support	7.51
Price	7.34
Range of features	7.27
Fall-forward speed support	7.12
Net management	6.81

SOURCE: FOCUS DATA, INC., FRAMINGHAM, MASS.

their primary vendor would be today.

When asked which modem supplier would be their primary choice, one net manager sums up respondents' sentiments: "Whatever is cost-efficient and

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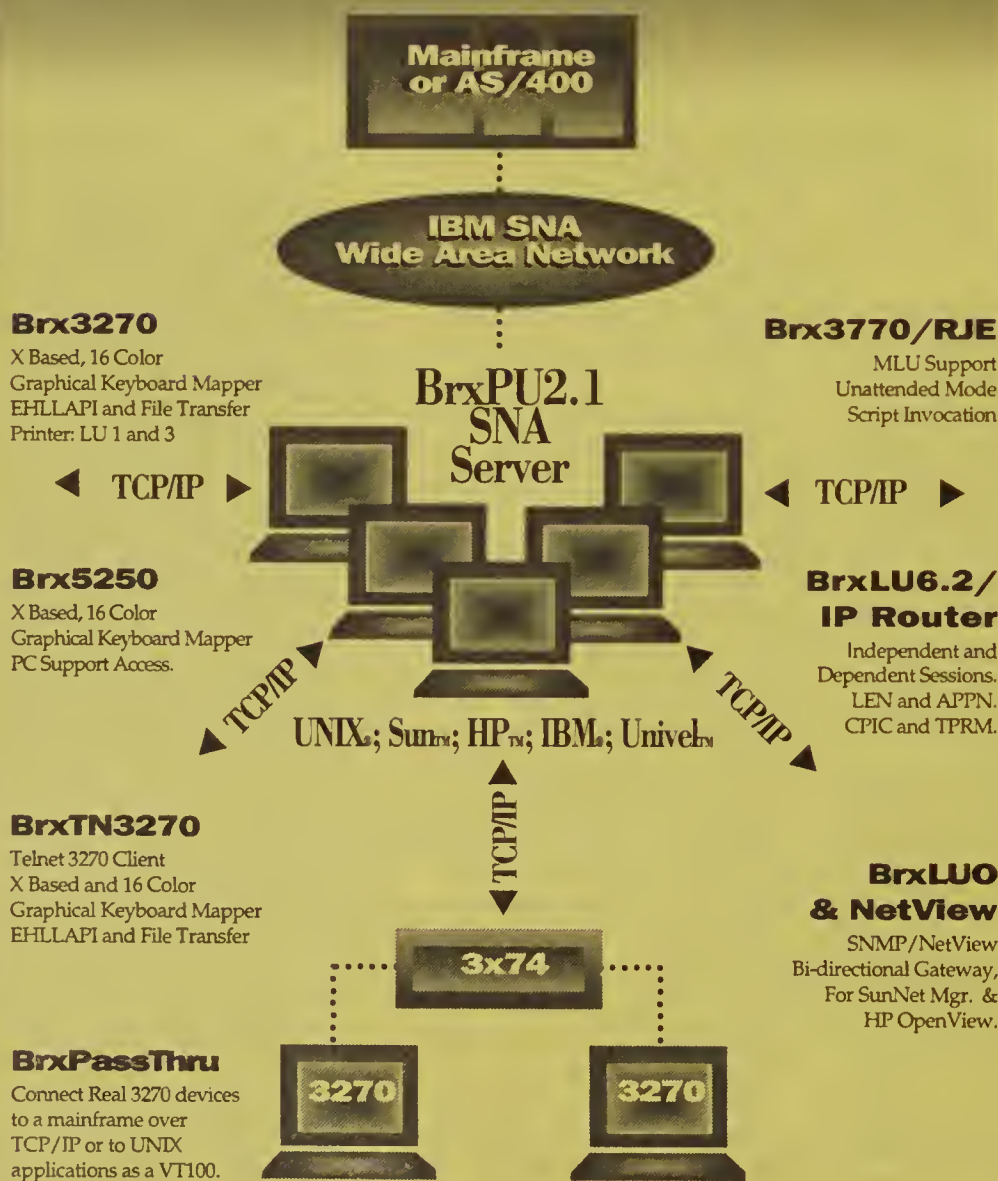
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179	180	181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206		

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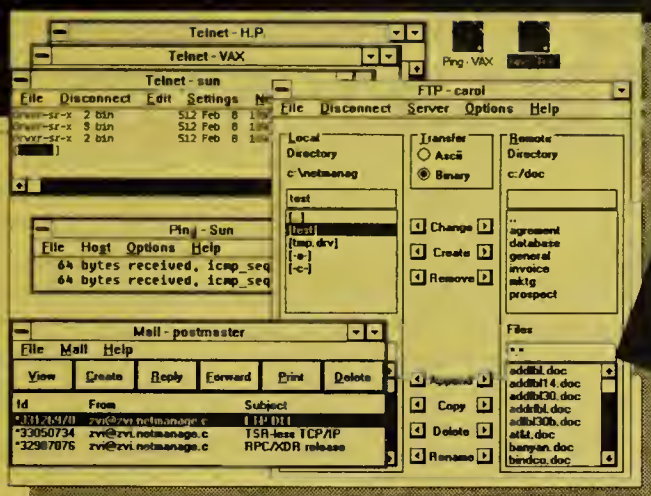


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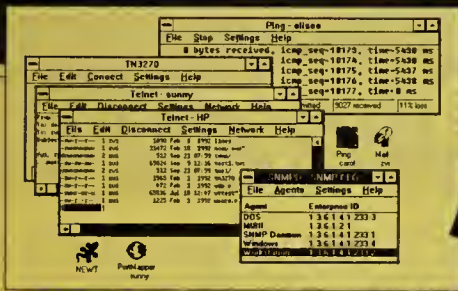
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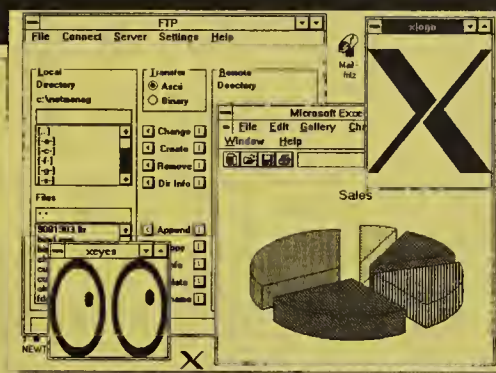
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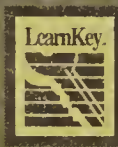
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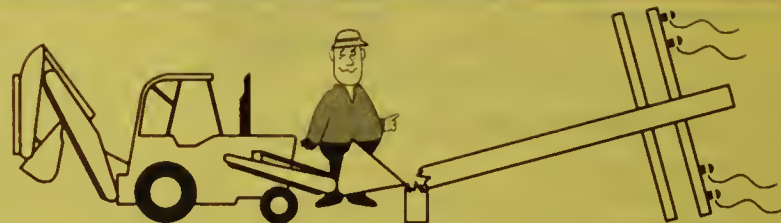
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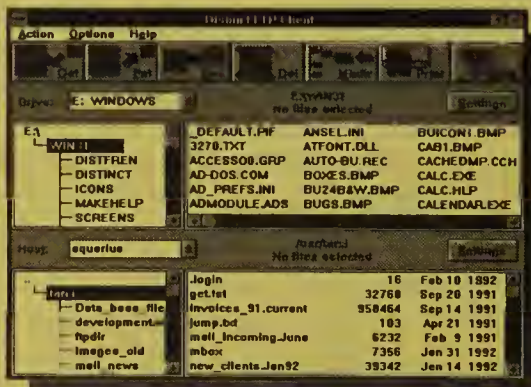
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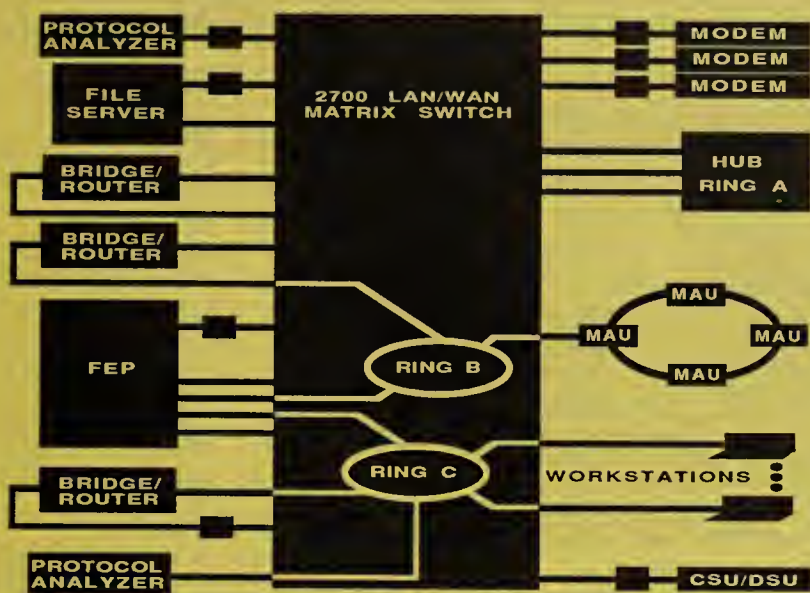
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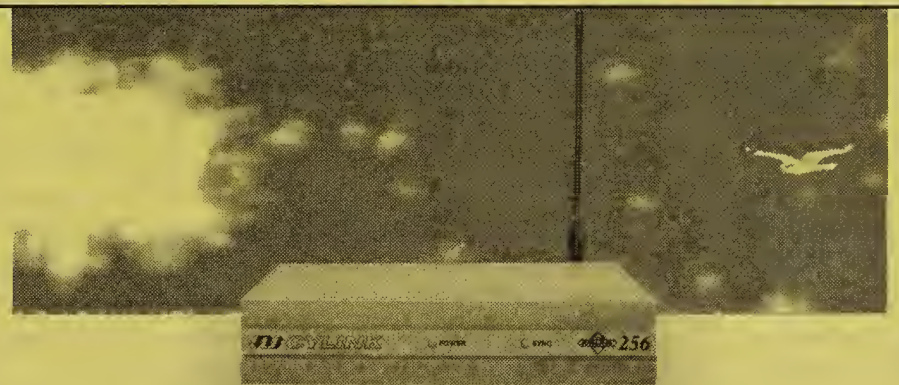


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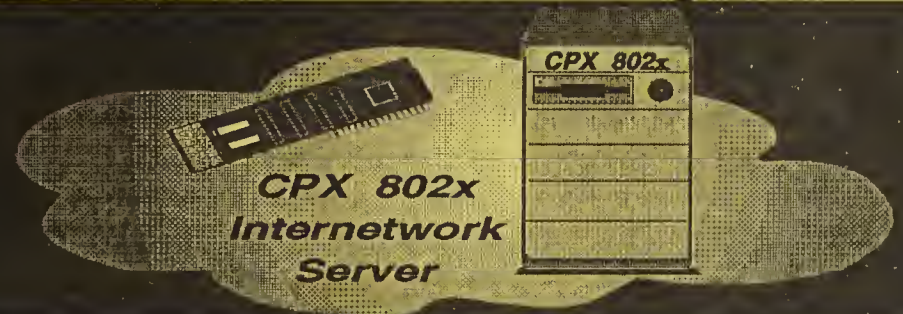


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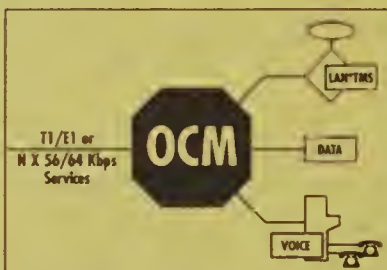
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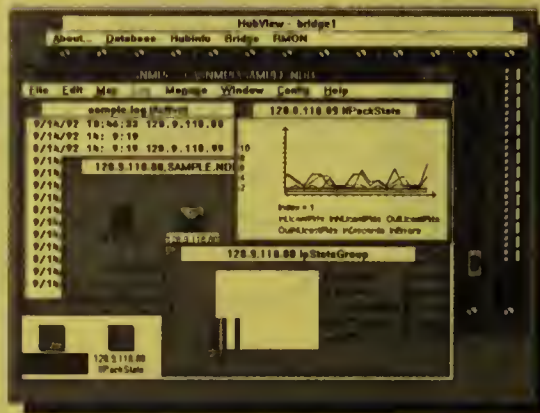
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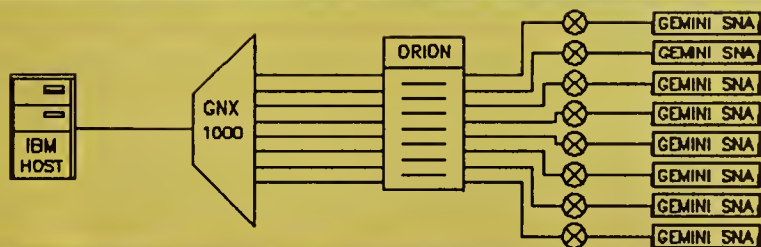


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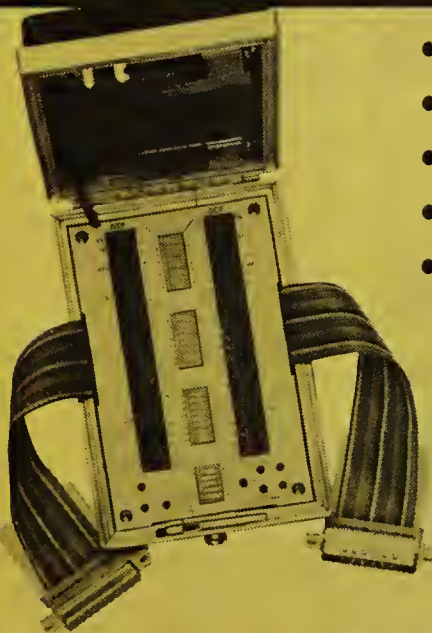
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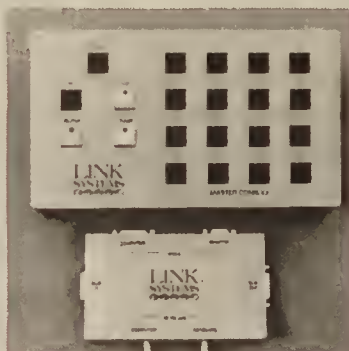
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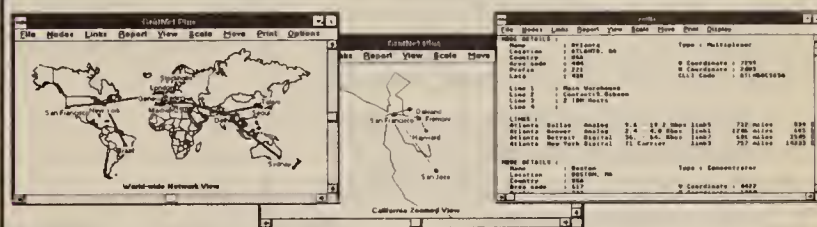
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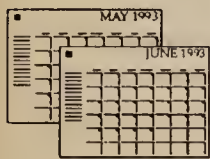


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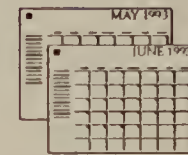
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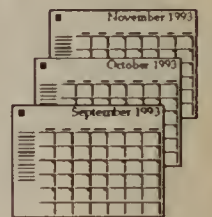
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Industry tackles mobile user issue

continued from page 1

Research Center in Santa Clara, Calif. They often have to navigate a confusing jumble of logons, passwords and connectivity procedures, depending on which net services they want to access. And network administrators often have to implement a mix of tools to support them.

"Getting it all tied together was frustrating," says Sharon Johnson, coordinator for information systems at Star Enterprise, a joint venture of Texaco

equipped to prevent accidental time-outs caused by noisy long-distance connections or satellite transmission delays on international calls.

The system should also minimize data transfers over pay-by-the-minute telephone lines. Data compression is an obvious step, but the NOS could also attempt to modify the client/server relationship, replicating often-used data on the client in order to minimize downloads. Packet overhead should also be minimized.

"The operating system should reduce the cost of connection by reducing the amount of time I have to spend with a direct link to my server," Dages says. Ultimately, the NOS "ought to allow me to [work] without being attached for the entire time."

But that's dangerous. Copies of files and data on the server and laptop can quickly fall out of sync, leading to havoc. Some applications, such as Lotus Development Corp.'s Notes, support data synchronization. But an application-by-application approach isn't the best answer.

Enter virtual, or deferred, connectivity, which lets users work as if they were connected to the network — sending mail and facsimiles, as well as transferring files and printing documents — even if they are sitting on a plane. A piece of the NOS residing on the remote client holds transactions in a buffer and executes them when the user reconnects.

A related function, called automatic synchronization, would transparently reconcile files on the mobile system with files on the LAN, making life easier for remote users and their colleagues at the office.

NOS vendors are investigating these ideas, but remote access is not a high priority, says Mike Feinstein, director of marketing for Shiva Corp., a Burlington, Mass., maker of network connectivity products. NOS vendors "haven't seen this as an important selling point," he adds. "As mobile computing grows, that could change."

"It's up to the NOS vendors to provide a standard way" of working in both connected and disconnected environments," he says. Application vendors could utilize the remote client services offered by NOS vendors to provide rich capabilities for mobile workers.

What's coming

Among the major players, the progress toward full client support of mobile users is mixed.

Novell, Inc. currently markets a pair of remote access server products, including NetWare Asynchronous Communications

Services, a NetWare Loadable Module for modem sharing and NetWare Access Services, which supports a maximum of 16 remote connections through a dedicated server.

But the firm's most ambitious work on remote access is focused on the client side, with Personal NetWare, which will "add significant technology to support mobile computing," says John Edwards, executive vice president of Novell's Desktop Systems Group.

Among other things, a laptop equipped with Personal NetWare would carry virtual connections to E-mail and network printers, he says, and would have copies of key files.

A disconnected user could continue working in the usual manner, and the notebook would defer all communications with the LAN into a buffer. When the user is reconnected, Personal NetWare would automatically send the E-mail and faxes, print the documents, and synchronize the files.

Personal NetWare is designed to be platform independent, working with DOS, Windows, Windows NT, Unix, OS/2 and Macintosh computers. Novell has teams working on each and hopes to deliver Personal NetWare by midyear, beginning with DOS and Windows.

While Personal NetWare is an admirable attempt to address real-life issues, it works only on the client side, so it's unlikely to solve all the problems facing remote users. But according to Bernard Harquindéguy, Novell's director of product marketing, the

with its AppleTalk Remote Access (ARA) and the AppleSearch information search and retrieval tool.

Running under Apple's System 7 operating system, ARA gives remote users an easy way to connect to an AppleTalk LAN. Remote users work with network resources as if they were local the users. ARA supports error detection and data compression optimized for modem connections. A remote access status window lets users monitor the network connection.

While ARA requires users to be connected, Apple isn't ignoring the idea of disconnected operations. AppleSearch, for example, allows mobile users to log on to the network, fire off a search and then disconnect. When they reconnect, users get the results of their search. AppleSearch is scheduled to ship in the third quarter.

ARA is part of Apple's new client/client/server architecture, which is designed to extend the benefits of client/server operations to remote clients by delivering network services and protocols that cater to them. Under that rubric, Apple plans to add new products and capabilities, including software agents that can operate in a disconnected mode, as well as support for new mobile devices and wireless communications options.

For its part, Microsoft Corp. is building the Remote Access Service (RAS) into its new Windows NT operating system. NT RAS will let remote users log on to the network as a full node, share files and printers, send E-mail, use group scheduling packages, access SQL databases and emulate 3270 terminals. Users will be able to reduce network overhead by turning off certain system features.

Windows NT will also include remote access client software that provides a common Windows interface for managing communication. The client implementation will include an application program interface to let applications exchange files automatically. Thom McCann, a product manager for Microsoft's Windows NT, says some version of this client software is likely to show up in Windows for Workgroups.

RAS promises to be a solid remote access platform, but it adds few new capabilities to what already exists in the marketplace.

Microsoft acknowledges that there is plenty of work left to do. "We need to do a better job of recognizing that a significant number of our customers out there

are mobile," McCann says. "The operating system should take on more of the remote client's needs."

McCann cites virtual connectivity, synchronization and smart file systems as long-term goals, but he refused to comment on Microsoft's specific plans for these technologies. He adds that the company is evangelizing developers to build slow link-aware applications.

NOS maker Banyan Systems, Inc. offers products for remote access, including VINES PC Dial-In and VINES X.29. VINES PC Dial-In automatically establishes the remote connection and provides data compression and a status information screen to give users feedback on their sessions.

Beyond that, there is little in VINES that directly addresses mobile users' needs. According to Banyan, it's aware of remote users' special needs. "We realize this is important," says a Banyan spokesman who declined to discuss future product directions. "A lot of these technologies and issues are new and still being researched."

The next step

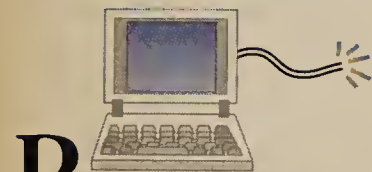
Banyan's point is well taken. Full client access for remote users is a tough technical nut to crack, and the need for such capabilities has only recently emerged. NOS vendors have already begun to respond to the needs of mobile users by trying to provide basic, easy-to-use connectivity tools. But given the potential for explosive growth in remote computing, fueled by new computing devices and communications services, NOS vendors need to make full support for mobile users a high priority.

Remote net access should become a core NOS service that works transparently with all applications, protocols and clients. It has to provide acceptable performance on a variety of connections, with provisions for extending security and network management to remote users.

NOS vendors won't get there overnight, but they have to recognize the issues and make strides toward addressing them. No one solution can be expected to satisfy everyone, so there's plenty of room for NOS vendors to differentiate themselves.

When LANs can provide complete, easy-to-use access for users connecting to the LAN in different ways, the benefits will extend far beyond laptop jockeys stuck in business class.

"Mobile issues are issues for everyone," says Gartner Group's Dulaney. If companies "really look at mobile computing, they'll design much better systems for all of us." □



Remote users are stuck in "mobile communications hell," Kenneth Dulaney said.



Refining & Marketing, Inc. and Saudi Refining, Inc. Johnson says Star spent "six months to a year getting the kinks worked out" of its remote access solutions.

"There's so much out there, it's almost too overwhelming," agrees Joe Clarke, a coordinator at American Express Co.'s Travelers Cheques International.

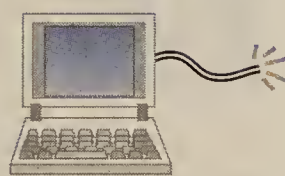
Because third-party products solve only part of the problem, some experts say net operating system vendors need to improve support for remote LAN computing. The goal, says Todd Dages, a vice president at The Yankee Group in Boston, is to "make the remote user a true client, if not a peer, on the network."

Making provisions

For one thing, the network operating system (NOS) should be able to distinguish between local and remote nodes. A remote node communicating at 9.6K bit/sec doesn't have the same class of access as a device linked to, say, a 10M bit/sec Ethernet. "It's the difference between a snail race and the Indianapolis 500," says Charles King, a founder of Network Products Corp.

Remote access is fine for checking electronic mail, says Malcolm Duncan, a senior programmer and analyst at Purdue University's Krannert Graduate School of Management, but "I certainly wouldn't want to do a lot of work on it. It's just not a solution to be used all the time."

The NOS needs to make allowances for the slower speed and vagaries of dial-up connections. For example, a NOS should be



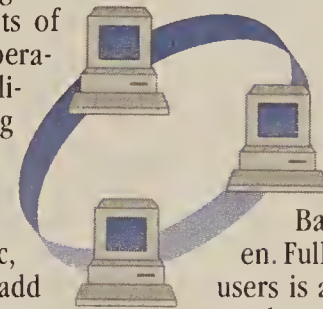
The goal is to "make the remote user a true client on the network," Todd Dages said.



firm is working to tie remote users more tightly into NetWare on both the server and the workstation.

Apple's view

Although not technically a NOS vendor, Apple has built networking into its base operating system and is aggressively pursuing a vision of mobile computing with such products as its upcoming Newton personal digital assistant. Apple's success with the PowerBook portables has led it into the remote LAN access arena



Realizing the PBX dream

continued from page 1

most of the big players plan to integrate ATM switching functions into their telephone systems, though at different paces and using divergent approaches.

Ultimately, the PBX suppliers see their products displacing some of the ATM LAN switches now emerging. Vendors of these switches have targeted traditional data applications but plan to take advantage of the 53-byte ATM technology to push into multimedia applications that require voice and video support.

They do not, however, see their LAN ATM switches rivaling PBXs.

"It's taken PBX vendors hundreds of man-years to develop the call processing software needed to handle voice," said Mark Juliano, director of marketing for Fore Systems, Inc., an



Kevin Oye

ATM switch vendor in Pittsburgh. "We don't have the time or the resources to reinvent the wheel."

Analysts say that makes good sense.

"They'd have to be out of their minds to develop the call processing software for their ATM switch to perform even rudimentary PBX functions," said Alan Sulkin, president of TEQConsult Group, a Hackensack, N.J., research and consulting firm. "That's definitely not their forte."

The PBX vendors, however, do not seem as willing to leave the LAN market alone. Tony Tissot, group manager of systems marketing for Rolm, said PBXs will initially coexist with ATM LANs and then provide some core ATM functionality.

Tissot sees Rolm developing ATM interfaces for its PBXs that would enable them to exchange traffic with ATM LAN switches. Beyond that, "we're looking at making a server that would be linked to a PBX and have an ATM switching fabric that our customers would be able to use for high-speed data switching," he said. "The server would pass traffic directly to a public or private wide-area network."

In that scenario, the PBX would do the work of an ATM hub of hubs, a device that LAN vendors such as SynOptics Communications, Inc. and Ungermann-Bass, Inc. have pledged to develop.

"The adjunct server would consolidate traffic from local-area networks and send it over a wide-area network," Tissot said. "This would be our plan until it's

cheap enough for us to move the ATM switching fabric into our PBXs."

Tissot stressed that incorporating ATM switching into Rolm PBXs is not a near-term plan. "This kind of evolution could take years," he said. "And bringing ATM switching into our switches may never be economical, so we may stay with the server approach."

AT&T's vision

AT&T is more blunt, saying it will bring more to the table in terms of high-speed switching than SynOptics, Fore and others can muster.

Kevin Oye, manager of advanced market planning, said AT&T has conducted tests in which it decoupled call control functions from the circuit-switched switching fabric in its Definity line of PBXs.

This is important because it will enable the company to employ the call control system — used to set up, tear down and route calls — to run an ATM switching fabric that AT&T is already testing.

"We will be able to marry our powerful call control software, which current ATM switches lack, to an ATM switching fabric that can support voice, data and video," Oye said. "We'll be able to offer a much broader and richer set of services than can be supported by today's ATM switches."

But for now, the tests are about as far as AT&T will go. The vendor is waiting for the ATM Forum to define signaling standards for ATM voice and video calls.

"Standards are the primary gating factor in this game," Oye said. "Our customers have told us clearly and repeatedly that they want products based on standards."

Once standards for these basic voice functions are set, AT&T will begin to extend the capabilities of its Definity switches by developing modules that users can add incrementally to support switching at ATM speeds.

"We want to get into the multimedia market full bore," Oye said.

Oye said two switching fabrics — circuit and cell switched — could coexist, but he declined to say how. "For a time, users will need both. They won't want to go [cell] overnight." AT&T said the migration will be achieved by having the PBX perform the conversion necessary to direct ATM traffic out over non-ATM WAN facilities.

Finally, Oye said his group is working closely with its sister company, AT&T Business Communications Services, to make sure that any premises-based ATM offerings work with the unit's planned ATM network ser-

vices. "Once the services are well defined, we'll provide the premises piece of the puzzle."

AT&T would neither say when it will begin offering the ATM add-on modules for its Definity PBXs nor discuss findings of the ongoing tests.

Northern Tel's view

Northern Telecom, Inc.'s plans are somewhat similar to those of Rolm in that it sees its PBXs aggregating voice and low-speed data and passing it to an ATM switch, which would hand it off to a public or private network.

"PBXs will continue for some time passing off voice and data in 64K increments," said Rick Moran, director of product marketing for Northern Telecom. "But in the long term, we've got bigger plans."

Northern Telecom recently announced the Magellan Passport, an ATM switch designed to replace its widely used DPN-100 line of high-speed packet switches.

"We eventually plan to physically integrate our Meridian PBX with our ATM switch," Moran said. "We'll start with the [highest end Meridian], the Option 81, and take it from there."

The introduction of ATM-based network services will largely dictate the switch maker's plans, Moran said.

"We've got to get the [network] services out there and accepted before people start deciding whether they want a PBX or an ATM switch," he said.



Tony Tissot

Moran said the future of the PBX with ATM is still very much up in the air. "Every conference I go to on ATM raises many more questions than it answers, which is incredibly frustrating," he said.

InteCom's look forward

Long a champion of switching high-speed data through its PBXs, InteCom, Inc. has ATM plans for its Integrated Business Exchange PBXs.

Howard Miller, vice president of engineering for InteCom, said the company will gradually transform its PBXs into ATM switches.

"The final step toward ATM will require the replacement of the circuit-switching capability with an ATM switching [fabric]," Miller said. "This won't happen in the next year, but the switch will eventually encapsulate voice traffic into ATM cells at the desktop and carry them all the way to a [public or private network]. ATM is the future." □

IBM focuses on APPN directions

continued from page 2

the Multiple Domain Support software in NetView Release 2 Version 2 that provides management services for APPN nets.

It works by automatically gathering net management information, such as link or device status, from attached OS/2 CMIP agents. The OS/2 agents pass the CMIP management data to NetView using an LU 6.2 session.

Using CMIP, users will be able to retrieve information from nodes beyond Systems Network Architecture and non-SNA devices, as well as gather network management information more dynamically than they can with NetView.

"[There's] no question that NetView's inability to dynamically gather APPN network management information is a big deficiency that this application could help," said Atul Kapoor, a principal with Kaptronix, Inc., a consultancy in Haworth, N.J.

IBM also demonstrated an accounting application that will let an OS/2-based NN keep track of all LU 6.2-based sessions that pass through it. This information can be used by a local network manager to track LU 6.2 sessions or be passed to NetView for central tracking.

Bob Fenoglio, an IBM advisory programmer, said the prototype platforms show how IBM intends to make APPN net management

more dynamic than current SNA management. "Some of the features demonstrated on the prototype can be done today with a lot of mapping and other time-consuming techniques," he said. "We want to give users more dynamic command and control."

Industry experts said the new applications would be helpful to APPN net managers but questioned the use of CMIP.

"It was a nice demonstration, but I'm not sure how it will play in the real world because there aren't many vendors or users implementing CMIP," said Lynn Nye, director of product marketing for Sync Research, Inc., an SNA communications product developer based in Irvine, Calif.

In other news, IBM announced the dates on which two of its most important APPN components would be available to developers. The firm said its dependent LU Requester (dLR) technology will be publicly available by June, and its High Performance Routing (HPR) specifications will be available in December.

dLR is the client portion of IBM's dependent LU Server (dLS)/dLR technology that lets 3270 devices participate in APPN nets. It resides in an APPN NN and works by encapsulating 3270 control data in an LU 6.2 session and sending it over the APPN net to an IBM mainframe containing the dLS function. VTAM 4.2, which IBM is expected to announce late this year, will support dLS.

APPN patent fight resumes

RALEIGH, N.C. — IBM stepped into an APPN pricing quagmire again last week when it told vendors attending the APPN Implementers Workshop (AIW) that they would have to pay a \$25,000 fee to obtain the rights to develop End Node (EN) implementations.

Advanced Peer-to-Peer Networking EN specifications are already published and in the public domain, meaning many vendors have built EN technology into their products free of charge. The IBM statement not only raises the specter of retroactive patent fees, it puts another barrier in front of vendors looking to implement APPN technology.

The \$25,000 APPN Technology Offering includes APPN trademarks, patents and copyrights that enable vendors to develop their own APPN Network Node or EN code without possibly infringing on IBM patents. Until now, however, it was not clear that EN technology was included in that package.

"The announcement surprised a lot of people because many of them have End Node and Low Entry Networking (LEN) node implementations already," said John Palombo, director of APPN development at Systems Network Architecture software maker Data Connection, Ltd. in London. "IBM didn't do much to ease the confusion over it, either."

Lynn Nye, director of product marketing at Sync Research, Inc. in Irvine, Calif., added, "IBM was saying that it might be wise for those vendors who have implemented End Node technology to check their patent portfolio. It caught a lot of people off-guard."

An IBM spokeswoman said IBM will provide a more definitive answer to the question of potential retroactive fees at the June AIW meeting. Meanwhile, IBM will likely offer a less expensive technology package for EN and LEN. No further details were provided.

— Michael Cooney

According to Jane Munn, IBM's manager of networking architecture, AIW vendors will have a chance to review the specification in early June so they can have suggested changes ready by the next AIW meeting later in the month. IBM will then take the suggestions, add the features deemed most important and submit the dLR specification to the Internet Engineering Task Force, probably by the end of the year, she added.

"Getting dLR out to as many vendors as possible is what we see opening up APPN," said John Palombo, director of APPN development at Data Connection, Ltd., a London SNA software developer. "We were glad to hear this."

HPR, which is key APPN technology, comprises Automatic Network Routing and the Rapid Transport Protocol. Used together, they give APPN the ability to dynamically route data around network failures and provide a three- to 10-fold net performance improvement.

By adding these features, IBM will quiet some big user concerns and eliminate most of the differences between APPN and its chief networking rival, the Transmission Control Protocol/Internet Protocol.

"The dLS/dLR and HPR features are what we're hearing the biggest demand for," Munn said. "We are working proactively with our other AIW vendors to get these features into products as soon as we can." ■

CA to port Unicenter to NT

continued from page 2

9000 Series Unix processors and has announced versions for a variety of other Unix processors, as well as for OS/2 and Novell, Inc.'s NetWare 4.0.

The inclusion of Windows NT under the CA-Unicenter banner lends credibility to Windows NT as an enterprise platform.

Windows NT is due out next month following several delays.

Ed Acly, director of software research at Technology Investment Strategies Corp. in Framingham, Mass., said the alliance will enhance Microsoft's appeal among corporate users as a provider of high-performance systems software.

"Microsoft is trying to put on its enterprise suit," Acly said.

Interestingly, Microsoft plans to ship in the second half of this year its own systems management capabilities for Windows NT in a product code-named Hermes.

However, Ruth Warren, senior product manager for enterprise computing at Microsoft, explained that Hermes will address different needs. The offering will handle configuration management, software and hardware inventory management, and software distribution.

"We have an integration plan under development that will allow data gathered by Hermes to be fed into CA-Unicenter," Gates

said at the press conference.

The NT version of CA-Unicenter, which will be available several months after Microsoft announces Windows NT later this quarter, will provide a subset of the functions found in the Unix versions of CA-Unicenter.

The NT version will support work load management, storage management, print control, problem tracking and security control.

Kurt Siebert, vice president of strategic business alliances at CA, said CA-Unicenter for Windows NT will not initially support console management, report distribution and performance management, or monitoring functions.

"These are functions which we don't think are as critical when managing desktop servers," he said. "However, when Windows NT starts showing up on high-performance servers, such as [Digital Equipment Corp.'s] Alpha, we will make these capabilities available."

Brigham Young University (BYU) in Provo, Utah, has been beta-testing CA-Unicenter on HP Unix processors and is pleased that it will be available on NT.

"As a university, it's guaranteed someone will implement Windows NT and want CA-Unicenter to manage it," said Doug Walker, assistant director of financial computer support at BYU. "It's helpful that CA is following up on their commitment to make CA-Unicenter available on a range of platforms." ■

More Microsoft deals

Microsoft Corp. last week revealed sketchy details of an agreement with Compaq Computer Corp. that the two companies are officially calling The Frontline Partnership.

The ultimate goal of the partnership, announced last week at the Federal Office Systems Exposition '93 trade show in Washington, D.C., is to give more power to the end user by providing personal computer-based products that are more advanced yet easier to use.

The companies mapped out several technology areas in which they will target development, including pen interfaces, audio capabilities, portable computers and products that meet the Plug and Play Industry Standard Architecture specification, which is designed to ease configuration of PCs.

Under the agreement, Compaq also pledged to bring out a line of PCs optimized for the entire line of Windows product, from Windows for Workgroups to Windows NT, although company executives declined to provide further details.

Finally, the two companies said they would offer joint product marketing and support, including cross-training sales organizations and sharing technical support information.

"Our goal with The Frontline Partnership is to accelerate the development of technology that will bring the PC industry to new levels of ease of use and integration," said Eckhard Pfeiffer, president and chief executive officer of Compaq in Houston.

Bill Gates, Microsoft chairman, concurred. "The opportunity to introduce the personal computer and Microsoft Windows software to new users in the office and the home has never been greater," he said.

Hewlett-Packard

In other news, Microsoft and Hewlett-Packard Co. next week will announce shipment of a driver enabling HP's OpenMail message server to support Microsoft Mail 3.2 clients. The driver, which will be shipped free of charge by both companies, will link Microsoft Mail clients to HP's X.400-based OpenMail via a prerelease version of Microsoft's Messaging Application Programming Interface.

HP is also working with Lotus Development Corp. to integrate its cc:Mail mail package with HP OpenMail. The Microsoft Mail driver will ship next month, while the cc:Mail driver will ship by year end.

— Caryn Gillooly and Wayne Eckerson

DOD overhaul going well

continued from page 4

ty to the more than 10,000 local-area networks and 650,000 workstations in place today.

Several military personnel at the FOSE show claimed that procurements for software and equipment have been frozen due to Directive 918. Some noted that DISA was demanding the first right of refusal for even small purchases.

"DISA hasn't finalized that yet, but we do want the first right of refusal," Oxley replied during his presentation. He said DISA has not implemented an across-the-board procurement freeze but acknowledged that the Office of Secretary of Defense has investigated several complaints. He said the base command often instituted the freeze and blamed Directive 918.

Oxley announced that the DISA plans to put in place a "fee-for-service" arrangement for networking and data processing within 30 days. He also said the Defense Department plans to prepare a final plan on DISA's role, the base closings, selected

data centers and network configuration in its Defense Information Infrastructure Plan this July.

Caught up in the changes, some technical personnel trying to build distributed systems say they are caught in a classic military regulation catch-22.

William Edelstein, computer engineer in charge of networks for the Navy Public Works Center's data processing center at the Norfolk Naval Base in Virginia, said his efforts to build a distributed database system has been stymied by Directive 918.

Edelstein pointed out that a separate order, Directive 967, compelled the Navy Public Works Center to make accounting and billing systems available to several Navy installations on a remote basis. So Edelstein and his staff last year began tying the host mainframe to LANs and T-1 lines to remote bases.

But Edelstein said he was told in January that a freeze on purchases of more than \$15,000 was now in place due to Directive 918. The Navy Public Works net still needs a distributed CDROM server, but Edelstein said he cannot buy the most cost-effective equipment. ■

Time Warner wants its ATM TV

continued from page 1

digital switching and storage technologies to our systems, we can create fully interactive broadband networks that will usher in the multimedia age," said Gerald Levin, chairman of Time Warner, Inc., parent company of Time Warner Cable.

The switch deal is the first of several contracts Time Warner expects to announce for FSN components in the coming weeks, according to a Time Warner spokesman. These components include terminal units for customer televisions, digital compression technology, video servers and optical storage systems.

Time Warner plans to use a single AT&T GCNS-2000 ATM switch to route information between multiple high-performance video servers and homes. The GCNS switch, which supports throughput of up to 20G bit/sec, will transmit information at 45M bit/sec (T-3) to homes and 155M bit/sec (Synchronous Optical Network) to video servers.

Time Warner plans to convert its backbone cable network to fi-

ber. It will run fiber trunk lines to neighborhoods of 500 homes and then run coaxial cable to individual homes. This boosts transmission capacity while leaving in place 75% to 80% of the coaxial cable network. In contrast, telephone companies, which have also committed to providing video-on-demand services, are faced with replacing low-bandwidth copper wiring to the home.

"[The installed base of coaxial cable] is the great advantage of the cable industry," the Time Warner spokesman said.

The deal is a major victory for AT&T as it is the first time the carrier will implement the GCNS-2000 switch outside of its own network. It also represents a potential bonanza for AT&T since Time Warner plans to roll out interactive services nationwide if the FSN trial proves successful.

With 7.1 million subscribers in 36 states, Time Warner could need thousands of ATM switches to support a nationwide interactive digital network.

Berge Ayvazian, senior vice president of communications re-

search at The Yankee Group in Boston, said AT&T is partnering with cable companies because it has not been successful selling to regional Bell holding companies. He said RBHCs view AT&T as a potential rival in the local loop.

Ayvazian pointed out that AT&T Microelectronics is working with the nation's largest cable operator, Tele-Communications, Inc. (TCI), to build digital encoding and compression cable converter devices that will enable TCI to deliver 500 video channels to customers.

TCI last week said it will spend \$1.9 billion over four years to upgrade its network with a fiber backbone (see story, p.21).

But TCI has not committed to ATM. Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif., said he was surprised at Time Warner's choice of ATM to the home.

"While ATM would provide greater flexibility in what Time Warner could offer, it is an expensive technology," Howard said. He added that if Time Warner rolls out FSN on a nationwide scale, the price of ATM chips is likely to come way down, making the service more affordable. ■

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StrataCom offers interface cards

continued from page 2

into 24 or 31 56K bit/sec channels, respectively.

StrataCom's current frame relay interface is a four-port, non-channelized card, meaning a single T-1 or E-1 link can support only one device. The per-port price of these cards is \$2,500 to \$3,500, whereas it costs about \$500 per device to provide a frame relay connection with the new cards.

Although applicable to private frame relay users, the new cards are primarily targeted at carriers looking to bring users of low-speed leased lines onto their frame relay networks.

"We're finding that 56K and 64K bit/sec connections constitute roughly two-thirds of the ports on most of the public frame relay services," said Andrew Greenfield, StrataCom product manager.

The new interfaces allow users and carriers to deploy lower end StrataCom switches in situations where they previously could only use a more expensive switch. For example, StrataCom's recently announced low-end IPX 8, which

holds five T-1 or E-1 cards, can now support as many as 155 frame relay users with the FRI E-1.

Previously, only StrataCom's high-end IPX 32 could support that many users.

The new cards may put added pressure on AT&T and WilTel to lower their frame relay prices be-

new interfaces.

Fitzgerald said she could not estimate how much the cards might reduce InterSpan's prices, however.

Chris Heckart, WilTel marketing manager for broadband services, said the carrier does not plan to lower its frame relay prices because they are already priced as if the new cards were installed.

However, analysts told a dif-

The new cards may put added pressure on AT&T and WilTel to lower their frame relay prices.

▲▲▲

cause they are already higher than those of Sprint Corp. and MCI Communications Corp., analysts said.

Jayne Fitzgerald, product-line manager for AT&T's InterSpan data services, said the cards would have "some impact on the prices [of InterSpan service] over time."

AT&T is currently testing the

ferent story.

"I've been talking to AT&T and WilTel, and they both say that they have to come out with new pricing," said Joe Noel, principal analyst for telecommunications at Dataquest, Inc., a San Jose, Calif., consultancy. Noel added that he talked to WilTel officials but not to Heckart.

Rob McKinney, product man-

Clinton plan hints Big Brother

continued from page 1

eventually replacing the Data Encryption Standard (DES). Ray Kammer, deputy director of NIST, last week said the group intended to reconfirm DES — which is now undergoing review — for another five years, but he said the federal government is leaning toward Clipper Chip as a preferred standard.

Clinton said he launched the encryption initiative to satisfy the balance between the need for privacy and the legitimate needs of law enforcement agencies, such as the Federal Bureau of Investigation, to monitor criminals who use encryption devices.

"While encryption technology can help Americans protect business secrets and the unauthorized release of personal information, it can also be used by terrorists, drug dealers and other criminals," according to a White House statement.

White House officials said the Clipper Chip system for escrow-ing keys will allow the government to gain access to encrypted information only with appropriate legal authorization. The officials also said they hoped that private industry would widely embrace Clipper Chip.

The chip is now being manufactured exclusively by Mykotronx, Inc. in Torrance, Calif., under tight NSA control. While the government is interested in find-

ing other sources for the chip, they noted that manufacturers would have to agree to strict security requirements and NSA controls in order to manufacture the chip products.

But government officials had a difficult time last week rebutting the question why any criminal would use a Clipper Chip-based product when the person knows the government could listen in, particularly since there are a host of other encryption products available on the market that are, in theory, unbreakable codes.

"A criminal probably wouldn't use it," said Mike Agee, marketing manager for secure products at AT&T, adding that Clipper Chip is for the rest of the world.

AT&T, which rushed out of the gate last week with an announcement that it would include the Mykotronx chip in its Telephone Security Device later this year, said it was not interested at this time in becoming an NSA-approved supplier of chipsets.

The announcement from the White House caused dismay among many long-time Clinton backers. Mitch Kapor, chairman of the Electronic Frontier Foundation, commended the White House for reviewing the encryption policy but questioned the wisdom of trying to impose on the public a standard based on a secret algorithm.

"A system based on classified, secret technology will not and should not gain the confidence of the American public," he said. □

NETWORK WORLD

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Framingham, Mass. 01701-9172
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Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

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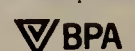
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